

USDA Forest Service, Tongass National Forest

Margaret-Traitors IRMP

Ketchikan-Misty Fiords Ranger District




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Introduction

The Ketchikan-Misty Fiords Ranger District has prepared this Integrated Resource Management Plan (IRMP) to assess resource needs and project opportunities in the Margaret - Traitors Creek Watersheds. The outcome of this process is an integrated package of activities containing a set of Need for Change statements, which provide rationale for changing the existing condition, and a list of possible activities to accomplish each change. This IRMP also includes a description of additional information that needs to be gathered, including field work, prior to implementation. Projects that rose to the top at the District level (see section – Project Integration, page 35) will be presented to the Tongass Leadership Team (TLT) IRMP subcommittee who selects proposals for the following fiscal year. Once additional data needs are met and funding is secured, the NEPA process will begin. The Need for Change and Possible Activities will evolve into the Purpose and Need and Proposed Action. Existing Condition information will contribute to the Affected Environment and Cumulative Effects sections of the NEPA document.

The Process

Each specialist on the Assessment Team (AT) compiled a report to describe the existing condition for their resource in the Margaret - Traitors Creek Value Comparison Units (VCUs) (Figure 1). The VCU was defined as the analysis area because it approximates a watershed boundary and often represents the use area of fish and wildlife species. Need for Change statements were developed to move the VCUs closer to the desired future conditions identified in the 2008 Tongass Forest Plan. Ideas of possible management activities to move the resource closer to desired future conditions culminated with a list of Possible Activities. Existing condition was assessed using GIS and previously collected field data, including reviews of the previously completed Margaret & Traitors Restoration Plans (USDA Forest Service, 2007), and site visits conducted by several members of the AT in July 2015.

In August 2015 the AT reviewed all of the resource reports, discussed the Need for Change and Possible Activities for each resource. Next, activities were integrated across resources for more effective and efficient implementation. The District Ranger then prioritized the list (see Project Integration, page 35).

Watershed Description

The Margaret - Traitors Creek VCUs are located approximately 35 miles north of Ketchikan, Alaska, along the western shore of Revillagigedo Island (Figure 1 & 2). Both Margaret and Traitors Creeks drains directly into saltwater at Traitors Cove. The Margaret VCU (7380) encompasses approximately 22,333 acres and contains 147.1 miles of mapped stream channels (Figure 3). The Traitors Creek VCU (7390) encompasses 25,118 acres and contains 145.9 miles of mapped stream channels (Figure 3).

Prior to European settlement the VCUs were used mostly for subsistence purposes. The VCUs are now within a mix development and non-development status (Timber Production, Modified Landscape, Semi-Remote Recreation, & Old Growth Land Use Designations (LUDs)) under the 2008 Tongass Forest Plan (Table 1, Figure 4).

Both the Margaret and Traitors VCUs have been extensively harvested, including harvest in the riparian management area (RMA), since the 1960's. The Margaret Creek VCU has over 5,000 acres of clearcut timber harvest, 23% of VCU, including nearly half the RMA, and over 32 miles of Forest Service roads. The Traitors Creek VCU has over 4,000 acres of clearcut timber harvest, 18% of VCU, including roughly a third of the RMA, and over 28 miles of Forest Service roads.

Because of past management activities both watersheds are listed by the Tongass National Forest as high priority restoration watersheds due to their valuable resources and their functioning-at-risk status.

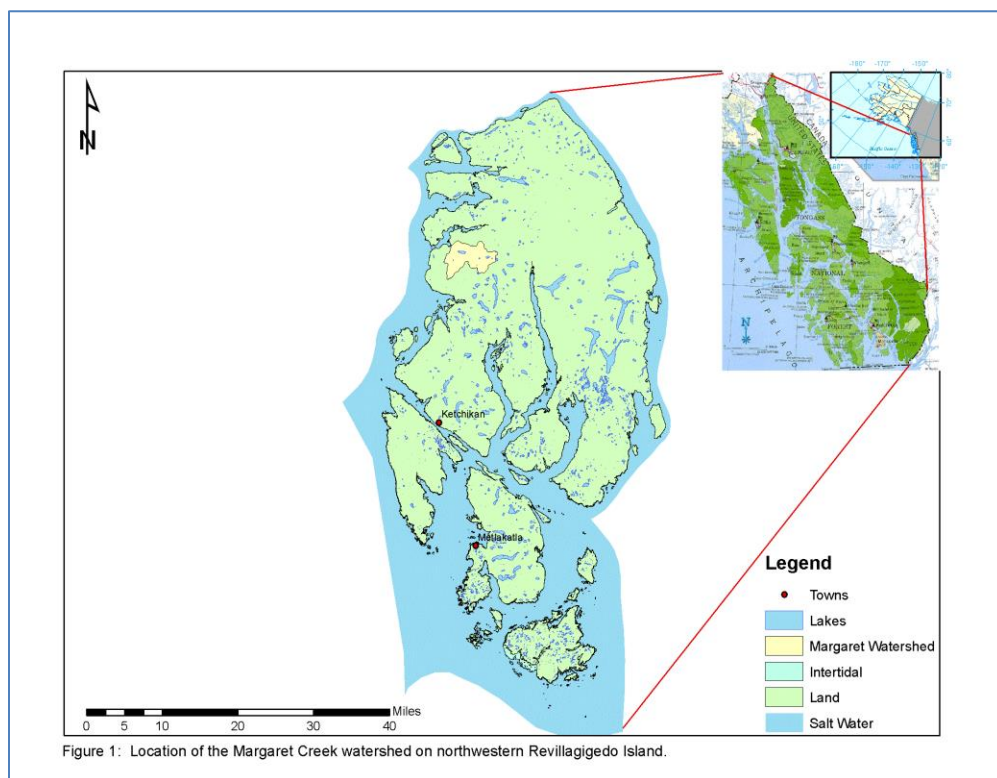


Figure 1. Margaret Creek Watershed - Vicinity Map

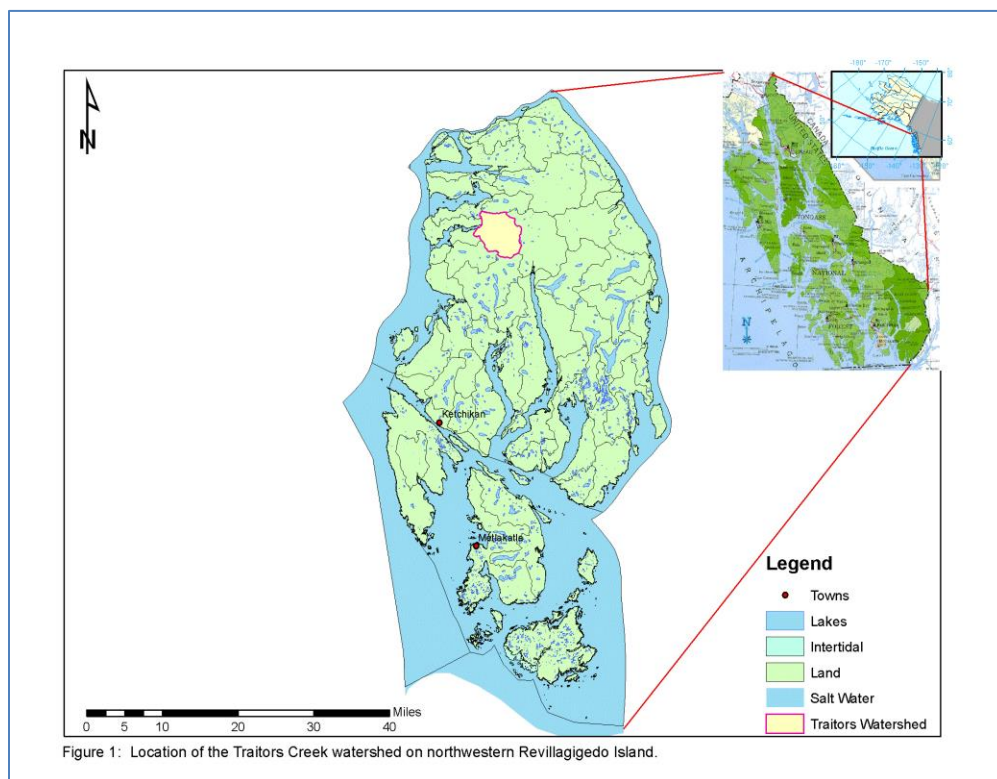


Figure 2. Traitors Creek Watershed – Vicinity Map

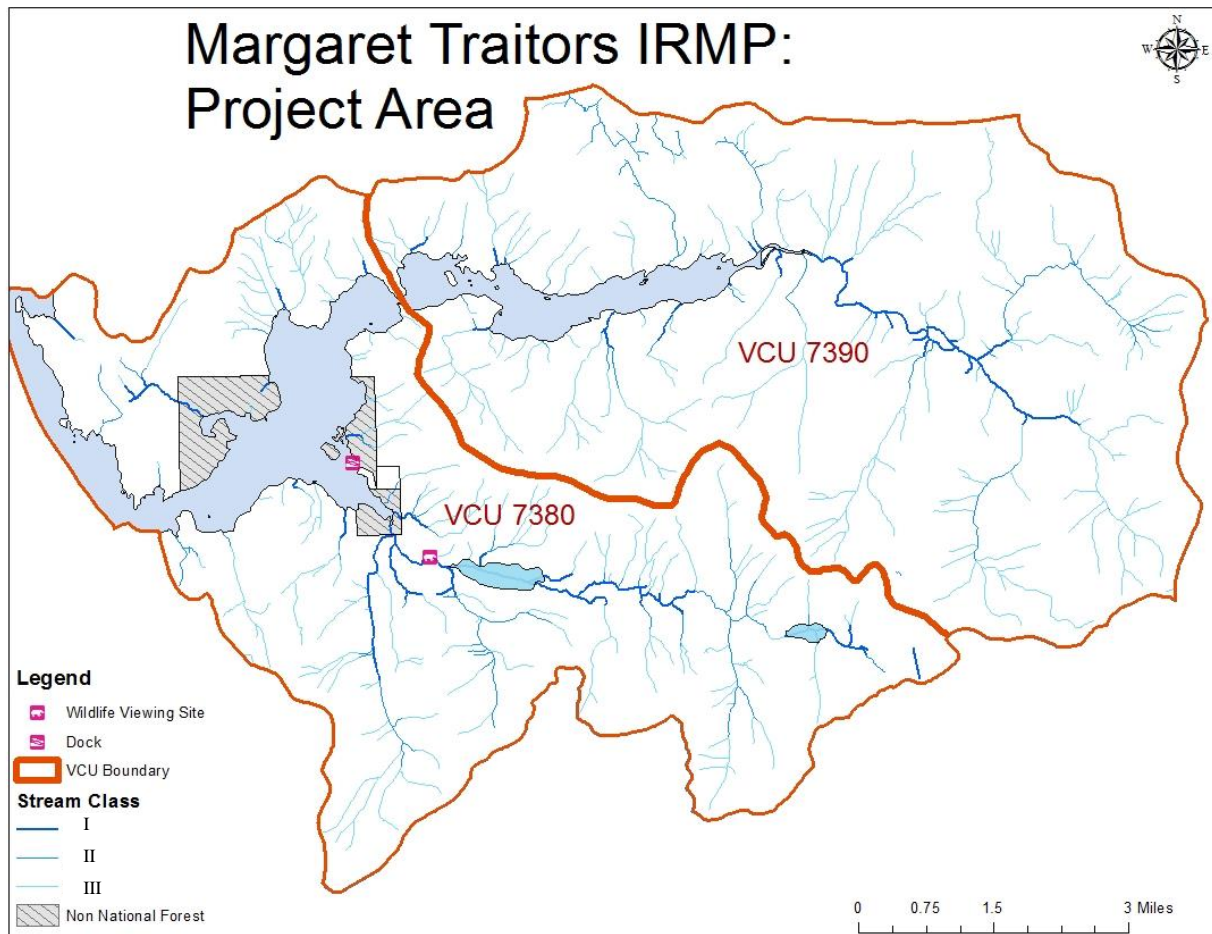


Figure 3. Project boundary showing VCU and Non-National Forest.

Table 1. Land Use Designations within the Margaret - Traitors Creek Watersheds.

LUD	Development Status	Acres ¹	Percent of Area
Timber Production	Development	29,366	68
Modified Landscape	Development	6,227	14
Old-growth Habitat	Natural Setting	7,452	17
Semi-Remote Recreation	Natural Setting	38	0.1

Source: Tongass 2015 GIS Coverage.

¹ Acres do not equal total watershed area due to portions of the watershed boundaries falling within saltwater.

Land ownership within Margaret - Traitors Creek VCUs is not complex. The Margaret watershed or VCU as a whole is predominantly under federal ownership and managed by the USDA Forest Service. However, within this 22,333 acre VCU there are 293 acres are managed by the State of Alaska, and 518 acres (Northern side of Traitors Cove) managed by the Cape Fox Village Corporation. The Traitors Creek watershed and VCU are entirely under federal ownership and managed by the USDA Forest Service.

The two VCUs have a maritime climate that has affected the physical and biological characteristics and the human uses of the area. The climate is predominantly cloudy, cool, and wet throughout the year with typically June being the driest month and October the wettest. The actual climate data within the area are likely to be much colder and wetter at higher elevations and further from saltwater.

Revillagigedo Island is located within a unique and complex meteorological area influenced by the interaction between the Pacific Ocean and the coastal mountains resulting in year round wet weather (persistent rains, overcast and fog, high humidity and low evapotranspiration rates). The semi-permanent Aleutian Low pressure system of the Gulf of Alaska creates a steady flow of storms throughout the area. These storms are then blocked by the surrounding coastal mountains of the Alaska Inside Passage resulting in heavy precipitation and high speed winds along the coast. It is this moist maritime climate coupled with wind disturbance that both supports and influences the landscape patterns of the lush coastal temperate rainforest of southeast Alaska with its cool, often drought free summers and transient sea level snow and cool winters. Presently there is no climate data available for the Margaret or Traitors Creek systems. The best available weather data recorded is from Ketchikan, but due to the topographic complexity of coastal southeast Alaska the data may not be reflective of either watershed's weather. Heavy rain events are common and may last several days to weeks with the majority of the precipitation falling during the winter months (September-February).

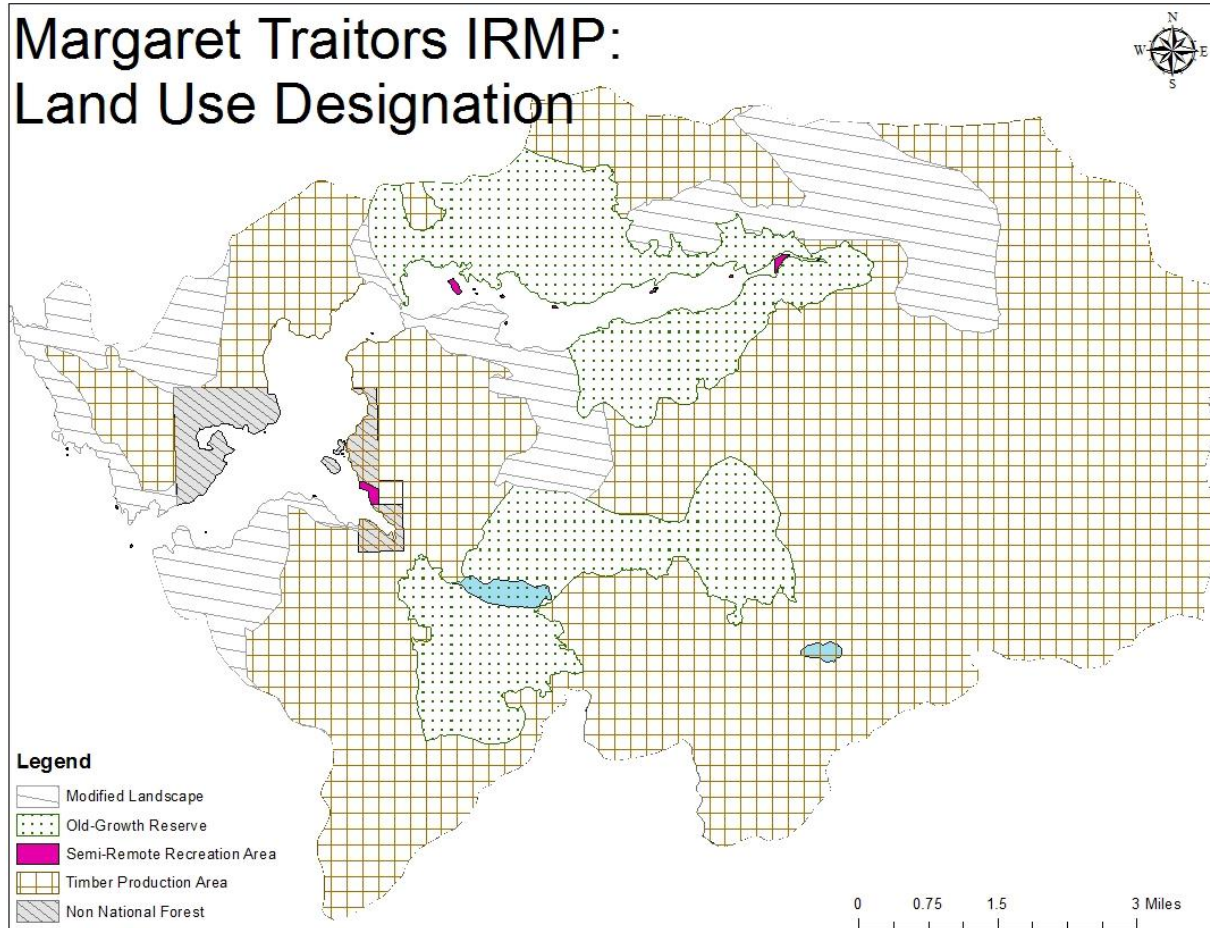


Figure 4. Margaret & Traitors Watershed – Land Use Designation

Resource Review

This section is organized by resource and briefly describes the existing condition, need for change and possible management activities to move each resource closer to the desired condition. For additional discussion, see the individual resource reports in the project record.

Although the VCU was used to define the analysis area of this project, some resources used a more defined boundary within these VCU's, such as aquatics whom used the US Geological Survey hydrological unit code 12 (HUC 12) watershed boundaries for the stream systems analyzed.

Aquatics

Existing Condition

For analysis aquatics focused only on the HUC 12 watersheds for Margaret and Traitors Creeks instead of the VCUs as a whole. The HUC 12 watershed boundary is representative of the actual effects of management activities on the dominant stream systems (Margaret and Traitors Creeks), while the VCU as a whole covers sub-watersheds not connected to Margaret and Traitors Creeks.

Margaret

The Margaret Creek sub watershed, hydrological unit code 12 (190101020303), is located in Southern Southeast Alaska on the northwestern part of Revillagigedo Island approximately 35 miles north of Ketchikan, Alaska.

The Margaret Creek watershed is 12,879 acres and is a true watershed, draining directly into salt water with third order and greater streams present. The Margaret Creek headwaters drain into steep glacially scoured mountains of central Revillagigedo Island and flow approximately eight miles to the west draining into Traitors Cove. The watershed has a western aspect with a maximum elevation of 2,900 feet extending down to sea level. The watershed is within the Traitors Cove Metasedimentary, Rounded Hills, Inactive Glacier Terrain Ecoregion of Southeast Alaska. There are an estimated 24.47 miles of fish bearing streams and 50.22 miles of non-fish streams in Margaret HUC 12 watershed, further broken down into channel type (Table 2). Margaret Lake is 145 acres, glacially scoured and a class one anadromous fish lake.

Table 2. Margaret HUC 12 watershed Stream Process Groups and total miles of stream miles of riparian harvest

Stream Process Group	Total Stream Miles	Class I & II (Fish) miles of stream	Riparian Harvest Miles of stream
Alluvial Fan (AF)	4.10	2.98	1.83
Estuarine (ES)	0.40	0.40	0.05
Flood Plain (FP)	3.71	3.71	2.16
High Gradient Contained (HC)	51.86	6.06	1.84
Low Gradient (LC)	1.04	1.04	0
Moderate Gradient Contained (MC)	4.35	2.89	0.21
Moderate Gradient Mixed (MM)	4.99	3.79	0.10
Palustrine (PA)	1.77	1.51	0.36
Lakes	2.45	2.09	0.08
Total	74.66	24.47	6.63

The Margaret Creek Watershed contains coho, sockeye, pink, and chum salmon, as well as resident and anadromous cutthroat & rainbow trout (steelhead), Dolly Varden char, kokanee, sculpin and three spine stickleback. The Margaret Creek Fish Ladder (Fishpass) was constructed below Margaret Lake in 1989 allowing seven species of anadromous fish (pink, sockeye, chum, cutthroat, Dolly Varden, coho and steelhead) access to over five miles of available spawning and rearing habitat above the fishpass (Figure 5).



Figure 5. Margaret Fish Ladder

Clear-cut timber harvest occurred in the Margaret Creek Watershed beginning in 1960. Greater than 10 percent of the watershed was harvested on slopes >72 percent. Nearly 24% of the Margaret Creek watershed was harvested with 9% occurring in the last 30 years. Timber harvest also occurred in over 40% of the Riparian Management Area (RMA) of Margaret Creek. The majority of the RMA harvest occurred in floodplain channel types; the most sensitive channel types to management for stream function and valuable fish habitat (see Figures 6 & 7). The harvest of the riparian management areas resulted in a lack of stream bank stability and necessary large wood, both in the channel and for future recruitment.



Figure 6. Legacy wood in Margaret Creek



Figure 7. Lack of large wood in Margaret Creek

According to the most current road condition survey (RCS) data (collected from 1995 to 2005), there are eight road crossing structures (i.e. culverts) that may not pass all life stages of fish (a.k.a. red fish crossings or red pipes) within the Margaret watershed.

Currently there are 23.41 miles of system roads and 9.24 miles of non-system roads in the Margaret Creek watershed. System roads on the Forest are defined as roads constructed or maintained for long term use. Non-system roads on the forest are defined as roads not constructed, maintained or intended

for long term use (i.e. roads built for temporary access for fire suppression, timber harvest, and oil, gas, or mineral activities. These roads are temporary with often only one entry and are not open to the public.

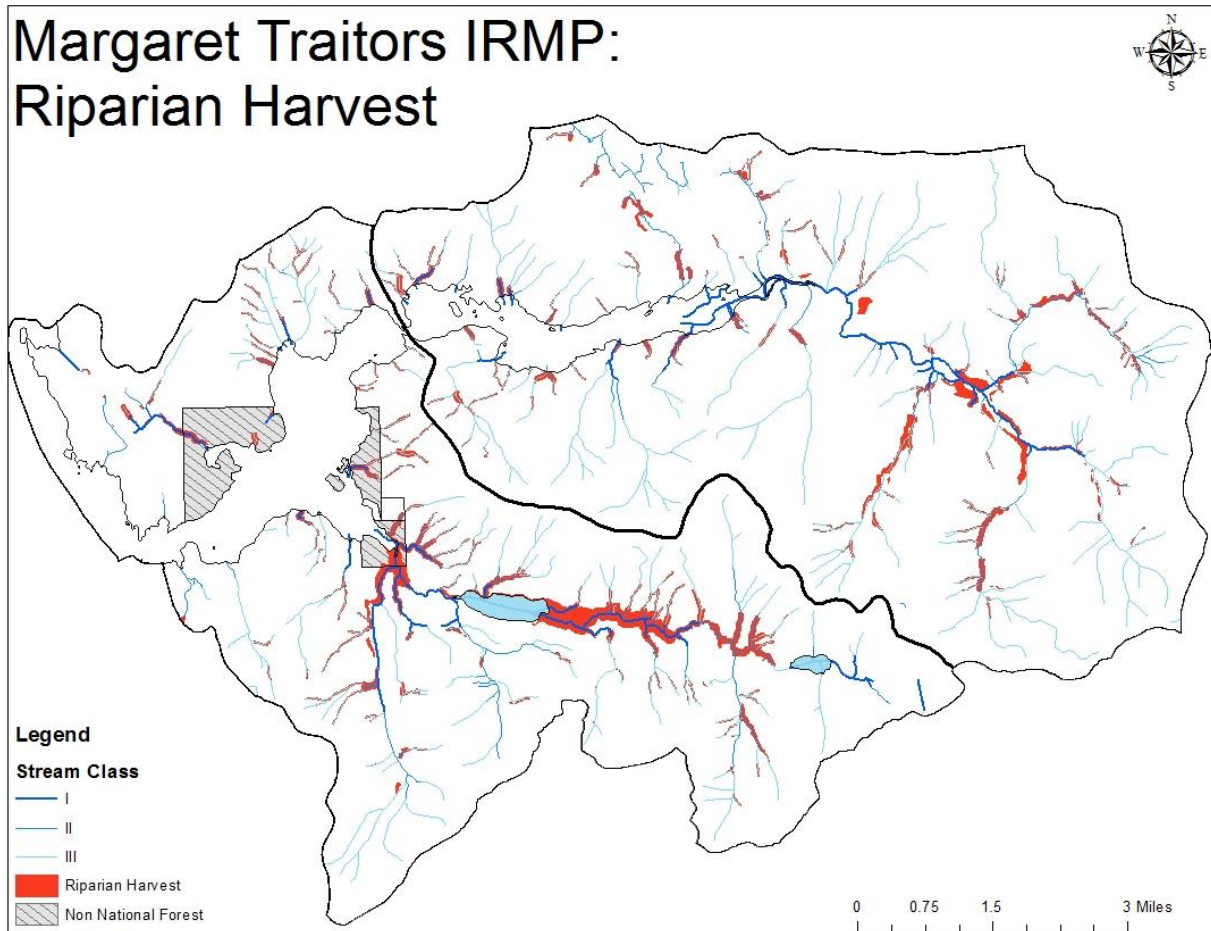


Figure 8. Riparian Harvest in the Margaret - Traitors VCU's

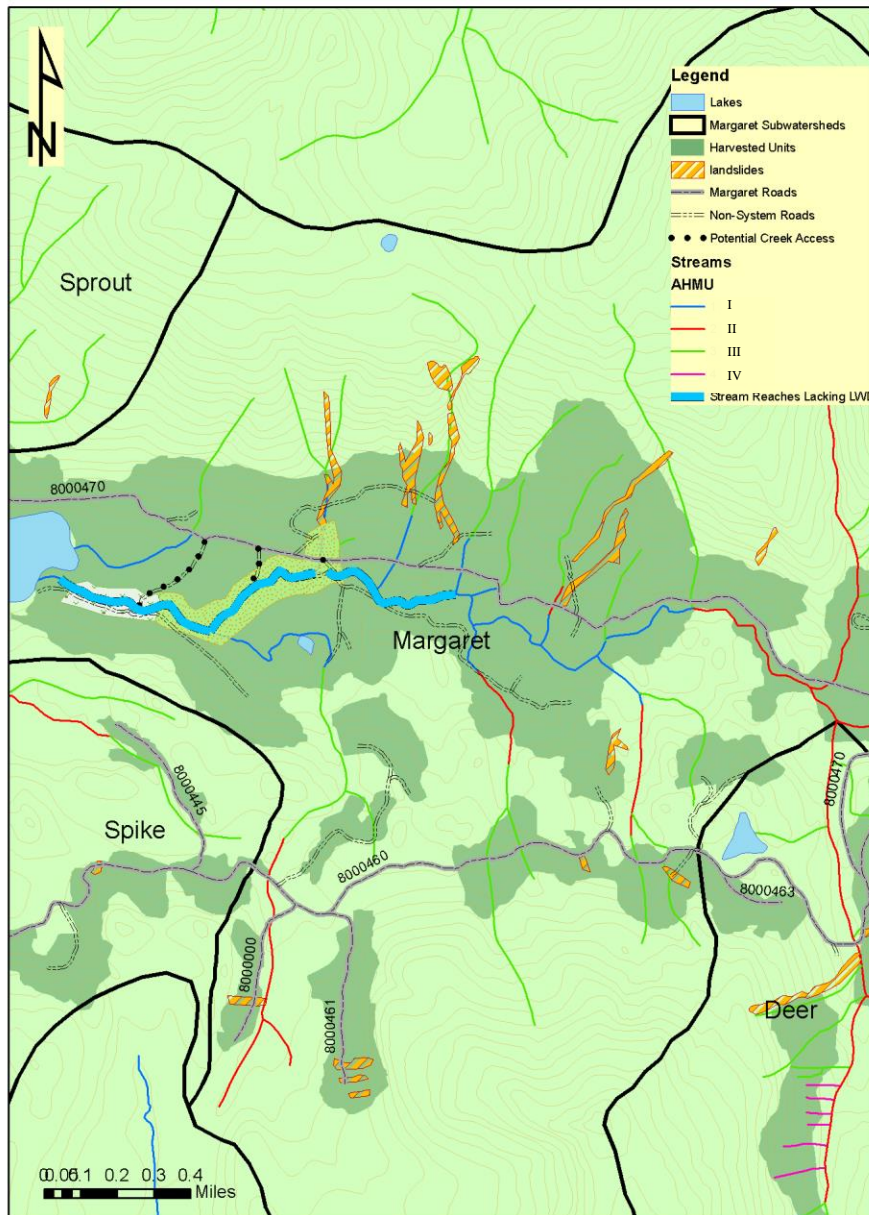


Figure 19: A map of the Upper Main Margaret Creek Subwatershed illustrating past and potential riparian restoration activities. Access roads for in-channel restoration work are also highlighted.

Figure 9. From Margaret Creek Restoration Plan (2007)

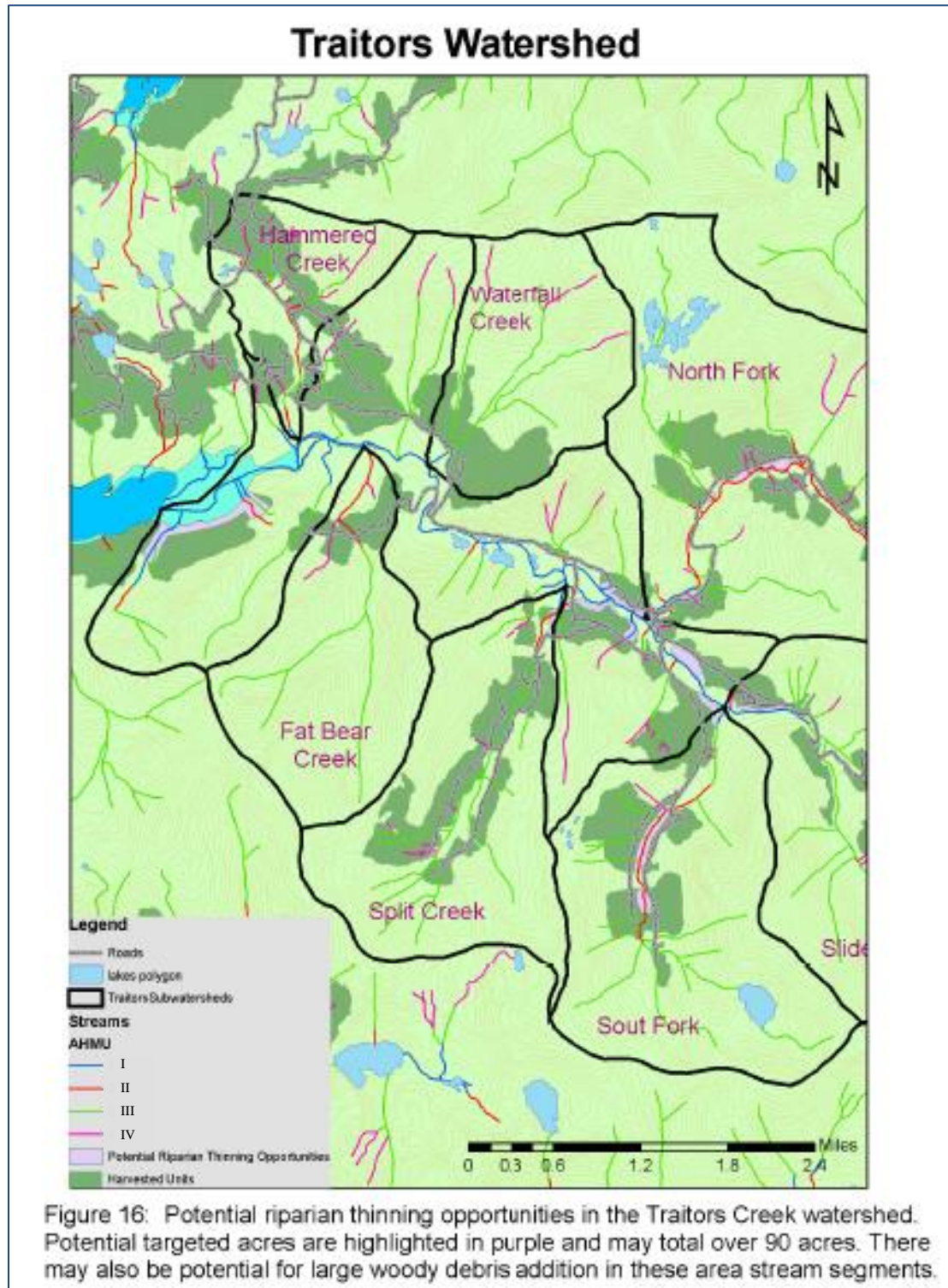


Figure 10. From Traitors Creek Restoration Plan (2007)

Traitors

The Traitors Creek sub-watershed, HUC 12 (190101020303), is located in Southern Southeast Alaska on the northwestern part of Revillagigedo Island approximately 40 miles north of Ketchikan, Alaska. The 17,003 acre watershed has a western aspect with a maximum elevation of 3,500 feet that drains into steep glacially scoured mountains of central Revillagigedo Island and flows approximately eight miles to the west where it enters into Traitors Cove at sea-level. The Traitors Creek watershed is within the Traitors Cove Metasedimentary, Rounded Hills, Inactive Glacial Terrain Ecoregion of Southeast Alaska. Common landforms in the watershed include mountain slopes, valley floor, mountain summits, hills and coastal. There are an estimated 19.8 miles of fish bearing streams and 64.87 miles of non-fish streams in Traitors Creek watershed, further broken down into channel types (Table 3).

Table 3. Traitors HUC 12 watershed Stream Process Groups and total miles of stream miles of riparian harvest

Stream Process Group	Total Stream Miles	Class I & II (Fish) Miles of stream	Riparian Harvest Miles of stream
Alluvial Fan (AF)	4.63	2.42	0.50
Estuarine (ES)	1.06	1.06	0.05
Flood Plain (FP)	6.19	5.90	2.36
High Gradient Contained (HC)	61.25	4.40	0
Low Gradient (LC)	0	0	0
Moderate Gradient Contained (MC)	1.68	0.33	1.50
Moderate Gradient Mixed (MM)	7.65	4.80	0.74
Palustrine (PA)	0.72	0.18	1.07
Lakes	1.01	0.26	0
Total	84.67	19.35	6.22

The Traitors Creek Watershed contains coho, pink, & chum salmon, and steelhead trout (anadromous rainbow trout). Resident populations of cutthroat and rainbow trout, Dolly Varden char, sculpin and three spine stickleback have all been observed in the watershed and this includes both anadromous and resident Dolly Varden and Cutthroat. Sockeye and King have also been caught in the system but are not common (Andy Piston, personal communication, Alaska Department of Fish & Game Traitors 2007 WRP). Movement of pink and chum salmon up Traitors Creek is blocked by a barrier falls approximately 2.3 km upstream. Traitors Creek is not lake fed, and is subject to large fluctuations in flow.

Clear-cut timber harvest occurred in the Traitors Creek Watershed beginning in 1960. Nearly 18% of the Margaret Creek watershed was harvested with 16% occurring in the last 30 years. Nearly 20% of the RMA has been harvested. The harvest of the riparian management areas resulted in a lack of stream bank stability and necessary large woody debris, both in the channel and for future recruitment. Nearly 10% percent of the watershed was harvested on slopes >72 percent.

Currently there are 24.08 miles of system roads and 3.96 miles of non-system roads in the Margaret Creek watershed. System roads on the Forest are defined as roads constructed or maintained for long term use. Non-system roads on the forest are defined as roads not constructed, maintained or intended for long term use (i.e. roads built for temporary access for fire suppression, timber harvest, and oil, gas, or mineral activities. These roads are temporary with often only one entry and are not open to the public.

According to the most current RCS data (collected from 1995 to 2005), there are currently eight red fish crossings within the Traitors Creek watershed road system.

Water Quality Concern and Status

There are no state-listed water quality-impaired water bodies in the watershed. Propagation of fish and other aquatic species is the primary beneficial use of water.

Harvest activities and road construction modified the landscape and streams of this watershed. There are over 63 miles of Class I, II and III streams within harvested stands in the Margaret Creek HUC 12 watershed, and over 70 miles of Class I, II, and III streams within harvested stands in the Traitors Creek HUC 12 watershed. The majority of Class I and II streams in these watersheds are channel types that are sensitive when management activities are carried out within Riparian Management Areas (RMAs) or along stream channels.

Need for Change

Roughly 40% of the RMA has been harvested in the Margaret Creek watershed, and approximately 20% of the RMA has been harvested in the Traitor Creek watershed. Both watersheds have had extensive timber harvest since the 1960's, and contain a significant amount of roads.

Possible Activities

- Selectively thin and girdle trees within the RMA to increase conifer spacing and remove dominant red alder species to promote conifer growth, encourage understory development and old growth characteristics (Figures 9 & 10).
- Enhance stream habitat complexity and increase floodplain connectivity in Margaret and Traitors Creeks by adding large wood (Figures 9 & 10).
- Maintain and/or restore fish passage to historic (pre-harvest) conditions by replacing or removing barrier culverts (Red pipes) in both systems, and maintaining the fishpass within Margaret Creek.

Botany and Invasive Plant Species

Existing Condition

Non-native plant species on the Ketchikan-Misty Fiords Ranger District are found in both VCU's, with VCU 7380 having the most species.

Invasive species known to occur in the Margaret - Traitors Creek Watersheds are: purple foxglove (*Digitalis purpurea*), oxeye daisy (*Leucanthemum vulgare*), common St. Johnswort (*Hypericum perforatum*), hairy catsear (*Hypochaeris radicata*), and reed canary grass (*Phalaris arundinacea*). Vehicle traffic and road maintenance activities have helped spread oxeye daisy along the road system of both VCU's. Table 4 displays the number of acres and percent of VCU covered for each species.

Table 4. Acres of species present per VCU.

Row Labels	VCU 7380 (Acres)	% of VCU	VCU 7390 (Acres)	% of VCU	Grand Total (Acres)	% of Project Area
DIPU						
Purple Foxglove	63.599	0.49%	0	0.00%	63.599	0.21%

HYPE

Common St. Johnswort	0.231	0.00%	0	0.00%	0.231	0.00%
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HYRA3

Hairy Catsear	0.002	0.00%	0	0.00%	0.002	0.00%
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LEVU

Oxeye Daisy	3.442	0.03%	0	0.00%	3.442	0.01%
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PHAR3

Reed Canary Grass	0.181	0.00%	45.211	0.27%	45.392	0.15%
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Grand Total	67.455	0.52%	45.211	0.27%	112.666	0.37%
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Need for Change

Purple foxglove (Figure 11), oxeye daisy, common St. Johnswort, hairy catsear, and reed canary grass (Figure 11) need to be controlled or eradicated at the population source, to prevent further spread along the roads and to other recreation areas on the Ketchikan-Misty Fiords Ranger District.



Figure 11. Invasive plants along the road system, showing reed canary grass (Left), and purple foxglove (Right).

Possible Activities

- Thin and prune existing shrub and tree species along infested roads to allow mowing in late spring/early summer to control seed production and spread of invasive plant species.
- Hand pull and/or tarp small isolated populations of invasive plants.
- Spot spray targeted invasive plant species with herbicide
- Re-survey to determine treatment success.

- Re-treat to control or eradicate remaining invasive species.
- Monitor and control weeds in and around roads, facilities (e.g. marine access facility, log transfer facility, and bear observatory), rock pits if present, and adjacent areas where invasive plants may have spread.

Cultural

Existing Condition

“Traitors Cove” was named by British Captain George Vancouver Royal Navy on August 12, 1793, because of an encounter with “Indians in canoes” which had seemed so peaceable in the beginning but later turned “traitors” (Orth 1967: 981). See the Appendix “**How Traitors Cove & Escape Point Were Named**” in the cultural resource report.

“Margaret Bay” is a local name reported in 1961. However, the name Marguerite Bay has been used in editions of the Coast Pilot prior to 1960 (Roppel 1998:169).

Traitors Cove was called *Kuna’x* and/or *Xuxen* by the Tlingit. The small bay beginning at the tide race was called *Kunexi*...The Stikinkwan Kiksadi (Wrangell People) originally claimed Traitors Cove but at some time it was given to the Stikinkwan Xetltewedih who were regarded as an offshoot of the Sanyakwan Tekwedih (Waterman 1922, Olson 1967).

People have been utilizing the resources of the Margaret/Traitors IRMP project area for at least 1,900 years as evidenced by shell midden¹ sites (Table 6).

The Traitors Cove area falls within the historical territory of the Sanyakwan (aka Cape Fox People) *Naa.aa.ádi* clan of the Tlingit people. The *Neix.adi* clan also has historically recognized interests in the natural resources of this area. Part of the Traitors Cove/Margaret analysis area has been identified as traditional hunting and gathering areas for both these clans. These traditional hunting and gathering areas include almost the entire coastline of Traitors Cove, plus that part of the Southwest Neets peninsula coastline that borders Behm Canal. Furthermore, it includes the area along Margaret Creek and Margaret Lake, plus the area between the head of Traitors Cove across to Fire Cove on Neets Bay (Olson 1967, Goldschmidt & Haas 1998).

Much of the Margaret Creek and Traitors Creek Watersheds fall into the low probability zone for the occurrence of cultural resources. However, a significant portion of the Margaret/Traitors IRMP project area does fall within the high probability zone for there being cultural resources (USFS/SHPO Programmatic Agreement 2010).

These are:

- a. All land between mean lower low water and 100 ft. of elevation above mean high water, with no consideration of slope.
- b. Lake and stream systems containing, or known to have contained, anadromous fish runs; including a focus on barrier falls locations in such systems.
- c. Elevated/fossil marine, river, and lake terrace systems.
- d. Rock formations known for caves and/or rockshelters.
- e. Known sources of potential raw materials (such as concentrations of cedar trees).

¹ **Midden** is a refuse heap, mound, or concentration of cultural debris associated with human occupation and in Southeast Alaska usually containing shell, charcoal and sometimes bone, fire altered rock (FAR) and artifacts.

- f. Alpine areas if ethnographic or historic evidence or previous surveys conducted nearby indicate cultural use, such as high elevation mountain peaks overlooking saltwater that may contain rock cairns.

During previous projects proposed within the Margaret/Traitors IRMP project area discussions were held with the Organized Village of Saxman, the Ketchikan Indian Community, and the Metlakatla Indian Community regarding the Traitors Cove analysis area. Knowledgeable individuals in the Alaska Native community were also given the opportunity to comment during the scoping periods. All input from Alaska Native groups and individuals indicate that natural resources and locations in the Traitors Cove Margaret analysis area were important historically and are still being used by Alaska Natives today (USFS Files).

No sacred sites have been reported within the Traitors Cove Margaret Creek area, either by Tribal Governments or Traditional Practitioners. It should be understood that the existence of sacred sites and locations may sometimes remain undisclosed to outsiders because of concerns by the Alaska Natives about future protection to be accorded to these sites. However, sacred sites have to be identified by the Native communities to the Forest Service in order for those sites to receive any protection (USFS Files).

Approximately 204 acres of the proposed Margaret/Traitors IRMP project area have been surveyed for cultural resources (Table 5). However, the vast majority of the project area has not been surveyed (USFS Files). Therefore there is a high probability that sites exist within the proposed project areas that have yet to be discovered.

Table 5. Previous Archaeological Surveys Conducted Within The Margaret/Traitors IRMP Project Area.

Fiscal Year	Project Number	Project	Investigator(s)
1988	1988100552006	Archaeological Survey At Traitor's Cove	Hurley, W.
1989	1989100552003	An Archaeological Survey Of The Proposed Margaret Creek Fishways Project	Autrey, J.
1991	1991100552002	Archaeological Survey Of The Proposed Indian Point Timber Sale	Fiefield, T.
1993	1993100552012	An Archaeological Clearance For Timber Harvest And Road Construction Proposed Under The North Revilla Environmental Impact Statement	Lively, R.
2001	2001100552005	Cleveland Peninsula & Traitors Cove Passport In Time (PIT) Site Inventory And Monitoring Program	Autrey, J. & Stanford, M.
2006	2006100552007	Around Revillagiedo Island Archaeological Site Survey and Monitoring	Stanford, M.
2014	2014100552023	Margaret Creek Wildlife Observatory Site Enhancement	Stanford, M.

Note: Image of table taken from Margaret-Traitors archaeological resource report.

There are nine (Table 6) known archaeological sites located within the proposed Margaret/Traitors IRMP project area.

Table 6. Known Archaeological Sites within The Proposed Margaret/Traitors IRMP Project Area.

AHRS NO	SITE	Date
KET-070	CABIN	AD Unknown
KET-100	CANOE LANDING	Unknown
KET-728	STREAM GUARD CABIN	AD 1949-1959
*KET-787	ROCK ART	Unknown
*KET-788	ROCK ART	Unknown
*KET-790	SHELL MIDDEN	1,940 ± 50 BP
*KET-936	SHELL MIDDEN	1,520 ± 70 BP
KET-1008	CULTURALLY MODIFIED TREES (CMTs)	AD 1800-1950
*KET-1299	SHELL MIDDEN	AD 1320 to 1340

*Determined eligible to the National Register of Historic Places.

Note: Image of table taken from Margaret-Traitors archaeological resource report.

Need for Change

If any of the proposed activities for the Margaret/Traitors IRMP project fall within the high probability area for the presence of cultural resources in the watersheds, funding cultural resource surveys should be provided to assist the District in meeting the objective of identifying, preserving and protecting cultural resources on the Tongass National Forest.

Identify, evaluate, preserve, and protect heritage resources. Protect heritage resources (as described in the Heritage Resources Forest-wide Standard and Guidelines). Provide public outreach about heritage stewardship (TLMP 2008 Chapter 2, p. 2-4).

Possible Activities

- If sites are identified, depending on the type of sites discovered, there could be an opportunity to provide public outreach about heritage stewardship through Windows on the Past or Passport in Time (PIT) Projects.
- If a public information kiosk is constructed as a result of the proposed Margaret/Traitors IRMP project, a short summary of the cultural resources indicating prehistoric and contemporary use of the area could be included. A very condensed version of "How Traitors Cove and Escape Point Were Named" (see Appendix in the cultural resource report) could also be included, which the public would likely find interesting.

Recreation

Recreation management goals and objectives for an area are determined by the area's LUD designation. Therefore, Existing Condition, Need for Change and Possible Activities for recreation are discussed by LUD.

Existing Condition

Margaret Creek watershed is located in the Margaret Bay Use Area, identified in the Ketchikan-Misty Fiords Outfitter and Guide Management Plan. The Recreation Opportunity Spectrum (ROS) classes for this use area include Roded Modified and Semi-Primitive Motorized. The visitor capacity estimate for this use area is shown in Table 7.

Table 7. Visitor Capacity for Margaret Bay Use Area

	Visitor Capacity Estimate	Guided Use Allocation
Spring (<i>April 20 – May 14</i>)	607	243 (40%)
Summer (<i>May 15 – Sept 30</i>)	3670	2752 (75%)
Fall (<i>Oct 1 – Oct 20</i>)	523	211 (40%)

The Margaret Bay is popular for both guided and unguided recreation users. Guided use is predominantly authorized for wildlife viewing with a small amount of freshwater fishing. Unguided use activities include sightseeing, fishing, big game hunting, wildlife viewing, hiking and off-highway vehicle (OHV) use. Current attractions and infrastructure include the Margaret Bay dock, the road system, Margaret Creek trail, Margaret Creek Wildlife Observation Site, an outhouse, and several interpretive signs. There is also a cabin for administrative use.

Traitors Creek watershed is located partially in the Central Revilla Semi-Primitive Non-Wilderness Use Area and partially in the Central Revilla Natural Accessible Use Area. The ROS classes include Semi-Primitive Non-Motorized and Roaded Modified. There is a small amount of unguided use in this area for hunting, fishing, and OHV use. The Fire Cove road system is especially utilized for recreation and subsistence use opportunities, particularly during the fall hunting season. There are established OHV trails in this area.

The Forest-wide objectives for Recreation and Tourism (TLMP Chapter 2, p.2-6) are as follows:

- Maintain existing Forest Service system trails to a standard that provides for the health and safety of all users. Construct or reconstruct trails to encourage a healthier lifestyle for the public. Emphasize projects that facilitate community use or community connections.
- Maintain existing recreation sites and facilities to provide for the health and safety of all users. Construct or reconstruct facilities in locations where the need for the facilities are supported by either long-term maintenance, or repeated safety concerns. Remove facilities that are no longer needed or are not affordable.

Need for Change

The Ketchikan-Misty Fiords Ranger District seeks to enhance the existing recreation opportunities in Margaret Creek watershed for both guided and unguided visitors. The desired condition for recreation in this LUD is to manage recreation and tourism use to meet LUD objectives for fish and wildlife resources and habitat, and generally provide for Semi-Primitive ROS settings, recognizing that more developed setting may be present due to authorized activities, existing use patterns, and activities in adjacent LUDS. Designation of motorized routes for off-highway vehicles is generally not allowed. (TLMP Chapter 3, p. 3-60)

Possible Activities

- Margaret Creek Wildlife Observation Site enhancement project
 - Replace the existing viewing platform with a new platform that would enhance viewing opportunities, offer covered shelter for visitors and staff, and elevate approximately 160 feet of trail to limit bear/human interface in an area containing multiple bear trails.
- Margaret Dock seafood cooking platform.

- Install a steel table/platform on Margaret dock for recreational boaters who are cooking crab and other seafood. The dock has been repaired multiple times due to propane burners scorching through the wooden decking.
- Installation of Interpretive Kiosks
 - Replace current signage with interpretive kiosks. Potential sites include: at the top of the pier, at Margaret Creek trailhead.
- Margaret Bay Public Use Cabin
 - Convert the Margaret Bay administrative camp to a public recreation rental cabin. Cabin could still be blocked out for administrative use when needed.

Roads

Existing Condition

An Access and Travel Management (ATM) Plan was completed in 2008 for the Ketchikan-Misty Fiords Ranger District defining which roads are open and closed. This plan also designates the use of these roads by different motor vehicles and off-highway vehicles (OHVs). The vast majority of system roads within the watershed are stable and in good condition. Non-system roads are generally closed to motor vehicles but may be used by hikers and hunters.

Road Condition Surveys (RCS) have been performed on the road system in the watershed. The Margaret Creek watershed has a total of approximately 23.41 miles of system roads and 9.24 miles of non-system roads. The Traitors Creek watershed has 24.08 miles of system roads and 3.96 miles of non-system roads. 14.2 miles are currently open to motor vehicle use under the Ketchikan ATM. Eight and a half miles are open to OHVs on the Margaret road system. According to the RCS data, there are 662 stream crossings in the Margaret watershed and 571 stream crossings in the Traitors watershed, of which 39 & 20 respectively have verified fish presence (Class I and II) (Table 8). The majority of the structures are culverts, modular and glulam slab bridges and one log stringer bridge. The total road density average for the Margaret HUC 12 watershed is 1.62 miles per square mile (Miles of road in watershed / Watershed area (Square Miles)), and the Traitors HUC 12 watershed is 1.06 miles per square mile.

Table 8. Riparian Harvest within the Watersheds

Watershed	Total Stream Crossings	Total Fish Stream Crossings	Red Pipes	Gray Pipes
Margaret	662	39	8	1
Traitors	571	20	8	1

Source: 2009 Tongass RCS Database.

The effects of roads on water resources vary by the type of road as well as its location in the landscape. RCS surveys and subsequent field visits have found significant OHV use occurring. No resource degradation was identified with this use.

Need for Change

Roads in RMAs or stream crossing structures, such as log stringer bridges and culverts, have modified stream flow regimes, diverted water from natural stream courses, and routed sediment to streams. Sixteen stream crossing structures, eight in each watershed, currently do not allow fish passage (red pipes).

In 2008 KMRD developed the Access and Travel Management (ATM) Plan Environmental Assessment. The purposed of this plan was to reduce the miles of open roads in order to reduce road maintenance costs. The reduced budgets and increasing costs meant fewer dollars were available for road maintenance.

Possible Activities

- Remove and replace the eight red pipes in the Margaret watershed and eight red pipes in the Traitors watershed.
- Every three to four years roadside brushing is required in order to keep the roads open and provide adequate sight distance. Other road maintenance work items include slide removals, removing and replacing culverts, bridge repairs, reconditioning roadway, shoulders, and ditches, cleaning out culvert inlets, and placement of rock lifts in areas that are identified. On roads that have surfacing, grading is needed to reduce potholes.

Soils/Geology

Existing Condition

Floodplains

Floodplains are important, in part, because they provide high value fish and wildlife habitat. Most spawning areas are found in floodplains, and floodplains often include smaller side channels that provide rearing habitat for salmon fry. Wildlife use floodplains for forage and travel corridors. Approximately 313 acres of floodplains have been mapped in the Margaret Creek Watershed and approximately 469 acres of floodplains have been mapped in the Traitors Creek Watershed. Over 50 percent of the floodplain soils continue to be in old growth condition and typically support high volume spruce stands. However, up to 300 acres have been harvested and often contain high proportions of red alder (Figure 8).

The floodplains in the Margaret Watershed with potential for restoration (previously harvested) are located upstream of Margaret Lake (Figures 12& 13) and near the confluence with Margaret Bay (Figure 14). The floodplains in the Traitors Creek Watershed with potential for restoration are located upstream of Bluff Lake (Figure 15) and near the confluence with Traitors Cove (Figure 16).

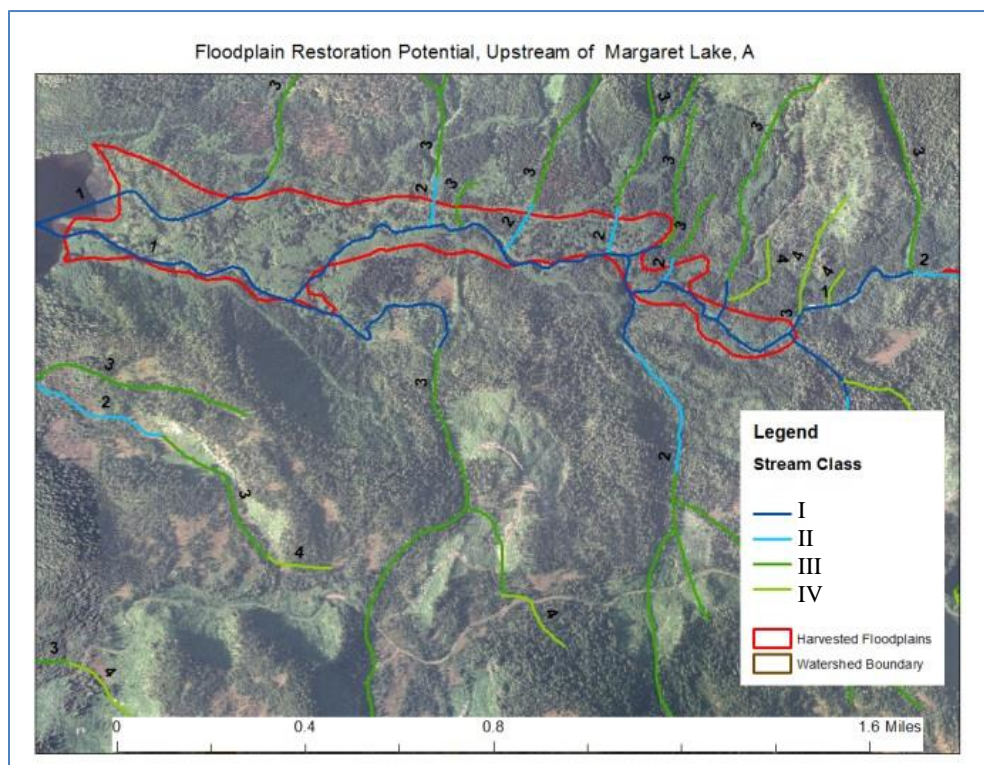


Figure 12. Floodplain restoration potential on Margaret Creek upstream of Margaret Lake.

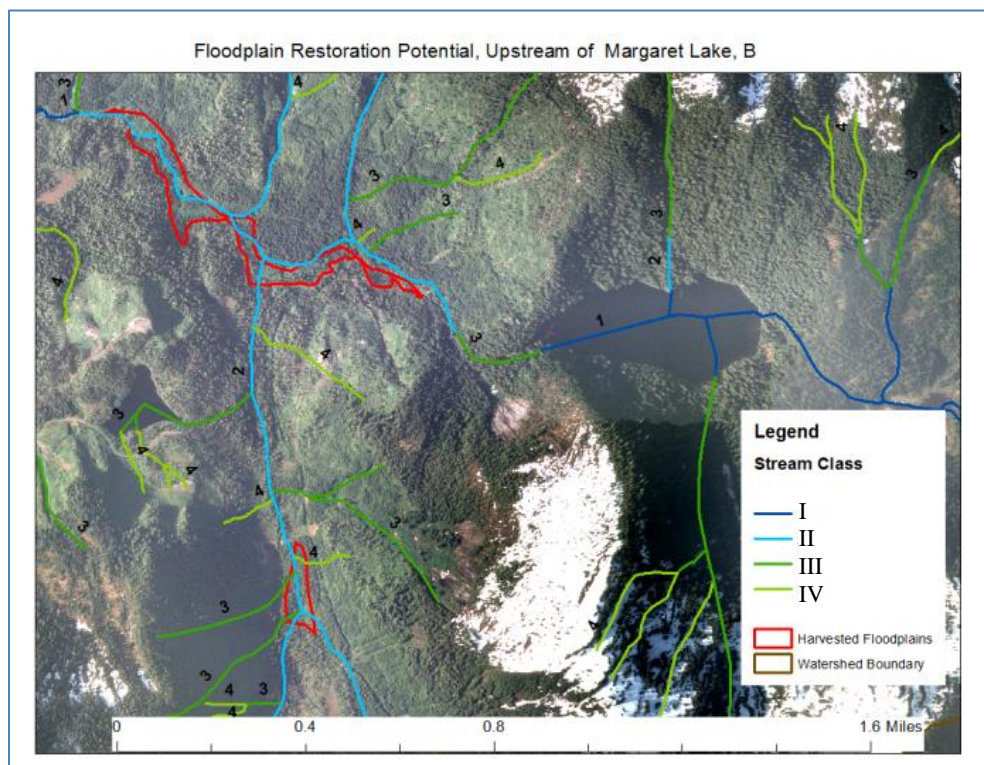


Figure 13. Floodplain restoration potential on Margaret Creek upstream of previous figure (12).

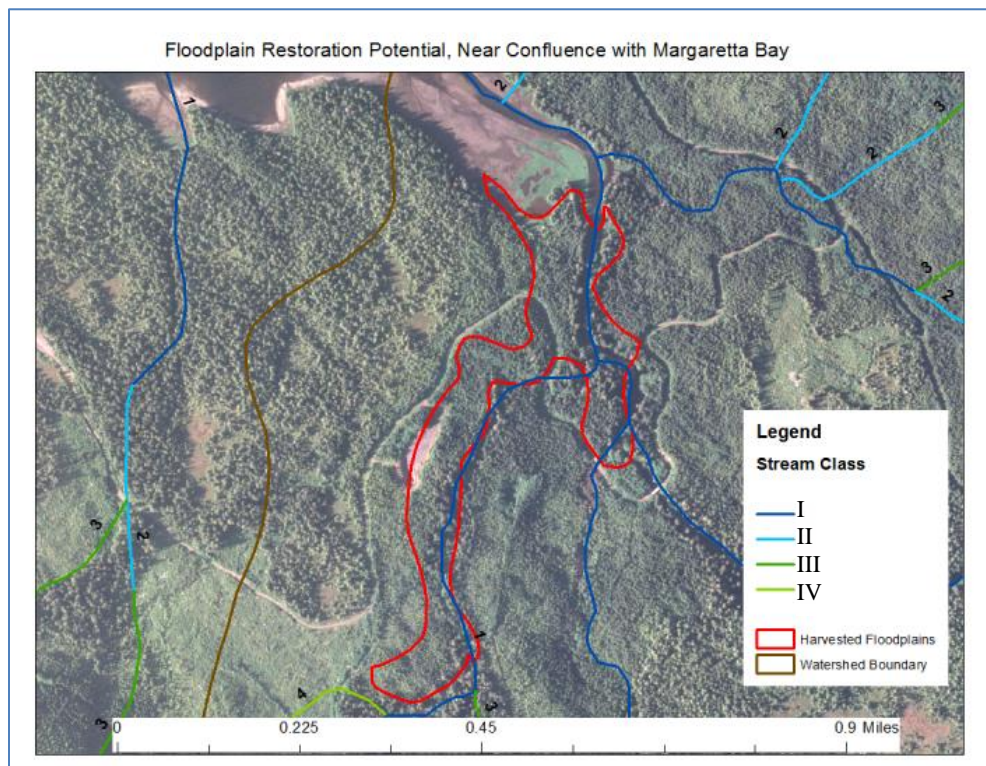


Figure 14. Floodplain restoration potential on Margaret Creek at mouth of Margaret Creek.

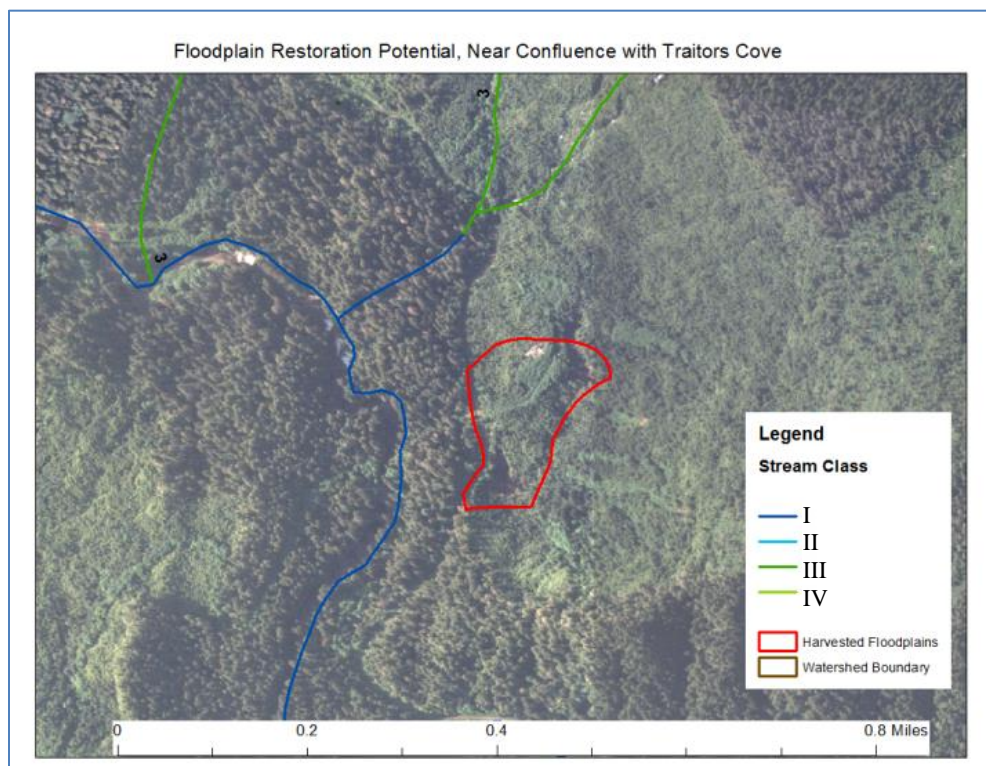


Figure 15. Floodplain restoration potential on lower Traitors Creek near confluence with Traitors Cove.

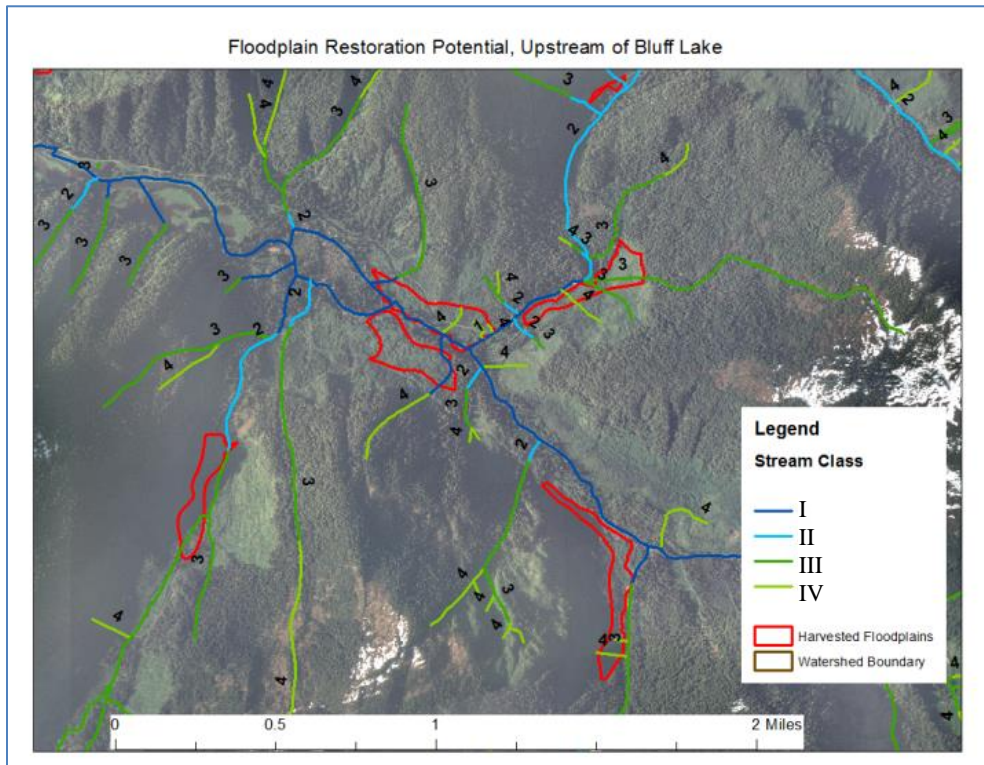


Figure 16. Floodplain restoration potential on upper Traitors Creek.

Slope Stability / Landslide Initiation rates (From 2006 report)

To date, 81 landslides have been identified in the Margaret Creek and Traitors Creek Watersheds. A study of 19 of these landslides occurring between 1995 and 1999 showed that a disproportionate acreage of landslides occurred over a granodiorite (Kpg) rock type (Gier, 2000). Additionally, the landslides over Kpg were larger and were the ones largely responsible for sediment that reached Margaret Lake. Of the four landslides identified as the primary sources of fine sediment to Margaret Creek in 1999, three originated in old growth stands (Gier, 2000). They subsequently overran recently harvested areas and did not stop until they entered class II streams.

The nature of landslides is that they can initiate in one area and subsequently spread to other areas which otherwise would not slide. To determine those areas responsible for starting landslides, the estimated origination points of all 81 landslides were placed in a GIS layer in order to perform a spatial analysis. Initiation rates (initiations per 1000 acres) were calculated using rock type, slope, and management status (harvested vs. old growth) as the spatial variables.

Firstly, initiation rates were calculated by slope and management class (Table 9). Initiation rates were the lowest (0.26) on old growth stands with less than 35% slope and the highest (17.4) on harvested stands with over 67% slope.

Table 9. Landslide Initiation in the Margaret Creek and Traitors Creek Watersheds by Slope and Management Status.

Slope %	Initiations		Acres			Initiation per 1000 acres		
	Harvested	Old growth	Total	Harvested	Old Growth	Overall	Harvested	Old Growth
0 to 35	2	2	9993	2288	7705	0.40	0.87	0.26
35 to 67	31	11	13248	3045	10203	3.2	10.2	1.1
Over 67	15	20	6699	864	5835	5.2	17.4	3.4

Secondly, initiation rates were calculated by rock type, separating out the areas near the contact between metasedimentary (MzPzms) and other rock types (Table 10). Initiations by all factors (slope, management, and rock type) were calculated by multiplying the initiation rate of a rock type by a factor for management status and slope class. For example, for MzPzms, the initiation rate is 3.0 and the factor for slopes over 67% on Harvested areas is 6.4 (17.4 / 2.7, where 17.4 is the initiation rate for slopes over 67% on Harvested areas (Table 1) and 2.7 is the overall initiation rate ((81/29840) x 1000). Therefore, the initiation rate for MzPzms on harvested areas over 67% slope is 19.2.

Initiation rates were dramatically affected by management status, slope class, and proximity to the contact between MzPzms and other rock types (Table 10 and Figures 17 & 18). Future landslides may well be initiated in the same general areas and be responsible for additional fine sediment within watercourses. Any restoration effort should consider their proximity to the identified most unstable areas and the effect that sediment load might have on the restoration effort.

Table 10. Landslide Initiation in the Margaret Creek and Traitors Creek Watersheds by Rock Type, Slope Class, and Management Class

Rock Type or contact zone(CZ)	Total Acres	Initiations	Initiation rate by rock type (per 1000 acres)	Initiations per 1000 acres					
				Total acres by category					
				Harvested			Old Growth		
				Slope			Slope		
				0 to 35%	35 to 67%	Over 67%	0 to 35%	35 to 67%	Over 67%
Kpg / MzPzms CZ	730	7	9.6	3.1	36.2	61.8	0.9	3.9	12.1
				87		7	482		154
MzPzms / MzPzmi CZ	91	1	11.0	3.5	41.5	70.8	1.1	4.5	13.8
				15		2	68		6
MzPzms / MzPzmv CZ	473	0	0 ¹	0¹	0¹	0¹	0¹	0¹	0¹
				109		19	246		99
MzPzms / Qu CZ	189	0	0 ¹	0¹	0¹	0¹	0¹	0¹	0¹
				79		10	88		12
MzPzms	18783	56	3.0	1.0	11.3	19.2	0.3	1.2	3.6
				3887		568	10890		3438
Kpg	4278	11	2.6	0.8	9.7	16.6	0.2	1.0	3.2
				407		111	2720		1040
MzPzmi	1106	2	1.8	0.6	6.8	11.7	0.2	0.7	2.3
				258		34	630		184
MzPzmv	3580	5	1.4	0.5	5.3	9.0	0.1	0.6	1.8
				346		113	2224		897
Qu	512	0	0 ¹	0¹	0¹	0¹	0¹	0¹	0¹
				146		0	360		6

¹ All calculations for these rock types resulted in 0 because no initiations were found in these areas. Future landslide initiations may still occur in these areas.

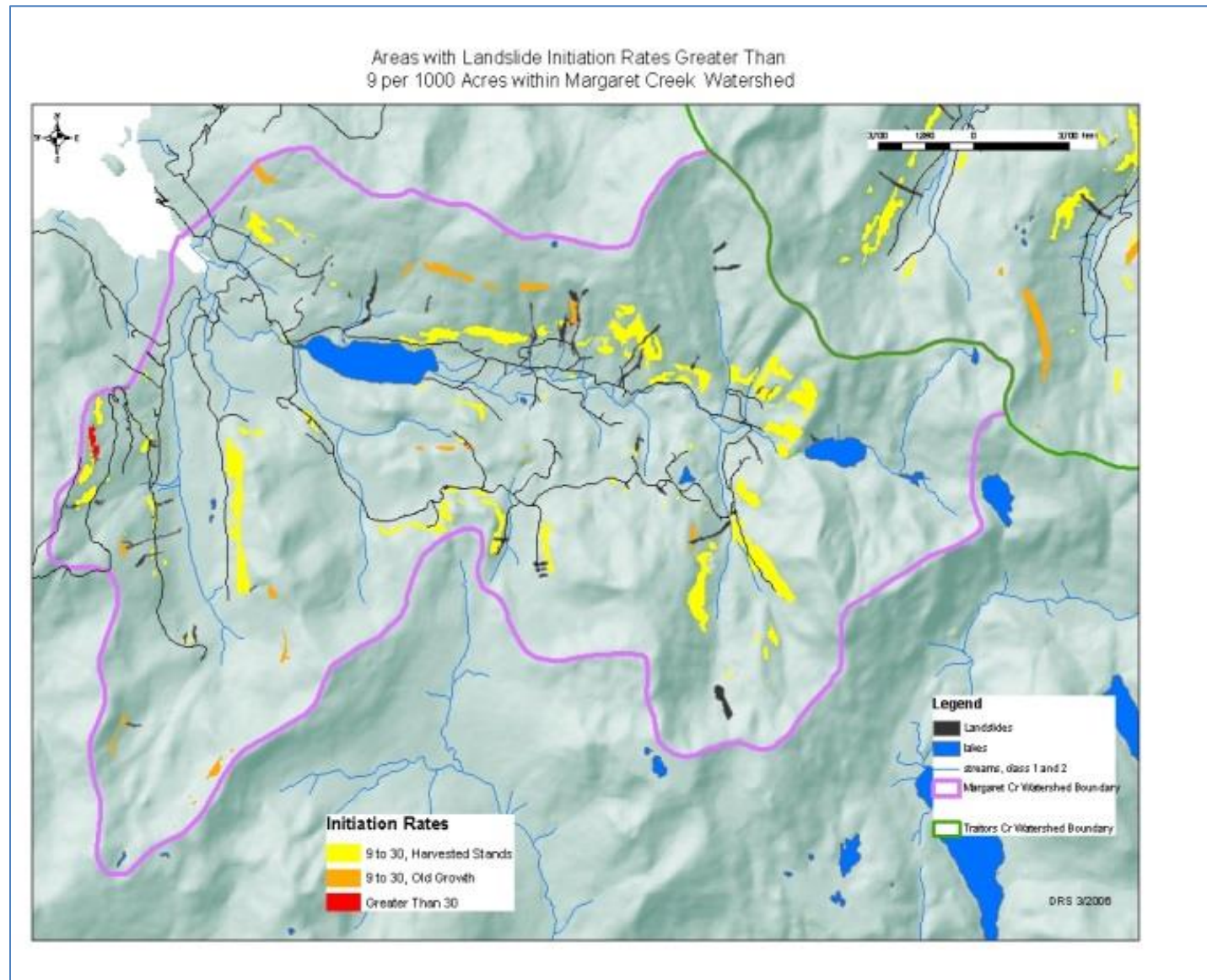


Figure 17. Areas with landslide initiation rates greater than 9 per 1000 acres within Margaret Creek Watershed.

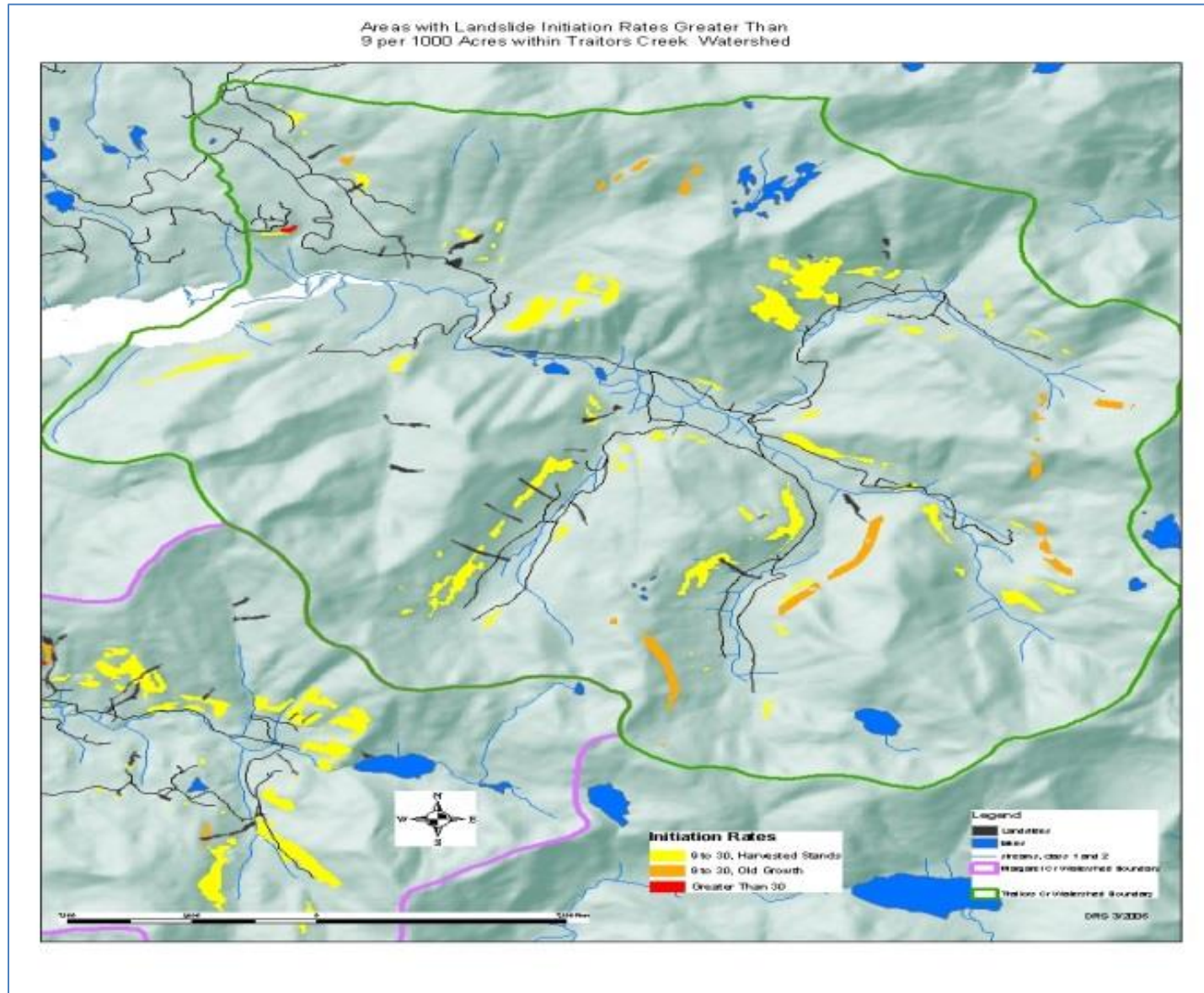


Figure 18. Areas with landslide initiation rates greater than 9 per 1000 acres within Traitors Creek Watershed.

For an analysis of this type to be valid, the spatial variables need to be independent. For example, if a particular rock type also contained a disproportionate high amount of slopes over 67%, then the results may exaggerate the landslide initiation rate for that rock type. Alternatively, if a particular rock type contains a disproportionate low amount of the harvested areas, then the results may underestimate the landslide initiation rate for that rock type. Table 11 and Figure 19 have the distributions of harvested areas and slopes over 67% by rock type. Deviations from the average show relative potential exaggerations and underestimations of landslide initiation rates. Using this method, the initiation rate for the contact zone between MzPzms and MzPzmi may be the most underestimated while no area appears to be grossly overestimated since no landslide initiations were found on the areas with the largest positive deviations. No statistical significance can be applied to this analysis.

Table 11. Distribution of Harvested Areas, Slope Class, and Rock Type

Rock Type or contact zone(CZ)	Total Acres	% of rock type that has been harvested	Deviation from average	% of rock type over 67% slope	Deviation from average
Kpg / MzPzms CZ	730	13	-8	22	0
MzPzms / MzPzmi CZ	91	19	-2	9	-13
MzPzms / MzPzmv CZ	473	27	+6	25	+3
MzPzms / Qu CZ	189	47	+26	12	-10
MzPzms	18783	24	+3	21	-1
Kpg	4278	12	-8	27	+5
MzPzmi	1106	26	+5	20	-2
MzPzmv	3580	13	-8	28	+6
Qu	512	29	+8	0.2	-22
ALL	29882	21		22	

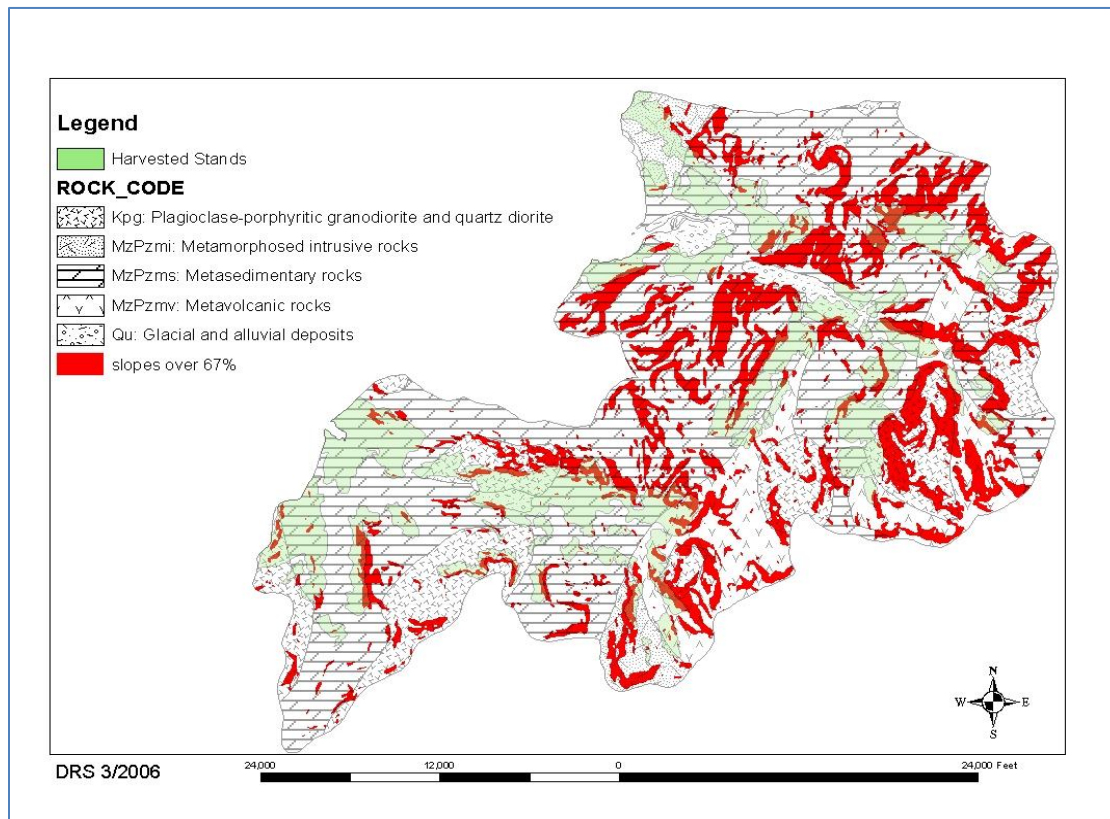


Figure 19. Geology, Slope, & Harvested Stands of Margaret & Traitors Creek Watersheds

Desired Condition

Floodplains

Executive Order 11988 directs Federal agencies to provide leadership and take action on Federal lands to avoid to the extent possible the long- and short-term adverse impacts associated with the occupancy and modification of floodplains. Restoration of affected floodplains is covered by Forest-wide Standard and Guide, Watershed Restoration: SW4, found on pages 4-66 and 67 of the Forest Plan (USDA 2008b). The desired condition of the floodplains within the Margaret and Traitors Creek Watersheds is, in part, to be providing fish habitat commensurate with the pre-harvest condition. A goal would be to raise the elevation of the main channel as needed to reestablish connections to side channel habitat.

Active floodplains also serve to collect fine sediment. Raising the level of the main channel would increase flooding activity (frequency and duration of floods). Partial diversion of water during high flows onto flatter portions of the floodplain would also collect fine sediment.

Slope Stability

The desired future condition of soil resources in the Margaret and Traitors Watersheds is to maintain a condition conducive to protecting and restoring associated resources. Events (e.g. landslides) and processes like bank erosion will continue to occur as will some surface erosion from other ground disturbances. Raising the stream base level to allow for the reestablishment of access to side channel habitat will require large woody debris in the main channel as well as some sediment load. Landslides are likely to diminish in frequency and volume with the maturing of the surrounding young growth.

Further diminishing landslide occurrence is very difficult and expensive and may in fact be counterproductive to restoring fish habitat in this instance. Practices to minimize detrimental disturbances, however, need to continue to be applied as needed to maintain soil productivity.

Overall, the desired condition for soils resources is to avoid irreversible or serious and adverse effects on them, and to prevent detrimental soil disturbance. This is achieved by following Forest-wide standards and guidelines for soils, which are found on pages 4-64 through 4-67 of the Forest Plan (USDA 2008b). Also, application of soil conservation practices to meet Alaska Region Soil Quality Standards (Soil Management Handbook, FSM 2554). Further, by implementation of BMPs (Soil and Water Handbook, FSH 2509.22). Forest-wide riparian standards and guidelines are found on pages 4-50 through 54 of the 2008 Forest Plan (USDA 2008a).

Need for Change

The need for change revolves around the desire to restore the full salmon-rearing potential of the floodplain. From the soil perspective, therefore, the depositional soils within the main channel need to be recreated.

Possible Activities

- Identical to fisheries – Large woody debris in the main channel.
- Fine sediment capture along side channels by partially diverting high water flows onto flat to gently sloping areas (see figure 20).

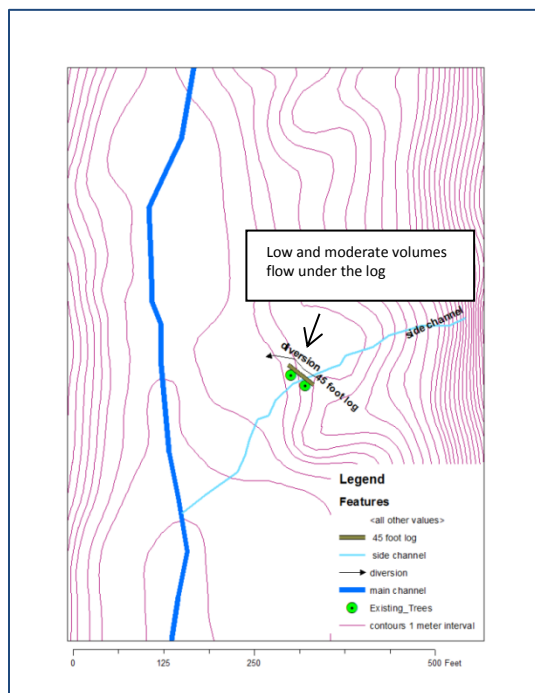


Figure 20. Side channel diversion example.

Vegetation-----

Existing Condition

The Margaret Creek VCU and Traitors Cove VCU is a diverse and dynamic landscape with considerable topographic relief. It contains a mosaic of young and old forests, muskegs, forested muskegs, and some alpine areas. Forest vegetation structure, composition, and distribution are largely determined by site productivity and soil drainage, as well as natural and human-caused disturbance. The dominant tree species in the watershed is western hemlock. Varying amounts of Sitka spruce, western red cedar, and Alaska yellow cedar are also found within the area.

The distribution and abundance of understory plants are highly variable and dependent on soil drainage, the distribution of large organic debris as a rooting substrate, the amount of light reaching the forest floor, and the type and amount of natural or human-caused disturbance. *Vaccinium* (blueberry, huckleberry) tends to be the most prevalent understory shrub. Salmonberry is common on disturbed sites, and skunk cabbage occurs throughout the area on wet micro-sites. The dominant forbs are typically five-leaf bramble and bunchberry. Various species of ferns, lichens, and moss are also numerous. The dominant plant associations^[1] are western hemlock/blueberry and western hemlock/blueberry/devil's club.

The plants in estuaries and along the beach fringe include red alder, and various sedges and grasses. Muskeg vegetation is a mixture of sedges, deer cabbage, sphagnum mosses, and low growing herbs such as Labrador tea and bog laurel. Muskegs typically contain numerous small ponds. Stunted, slow-growing shore pines grow on the less saturated areas.

Forest Vegetation Structure

Forest stand structures in the watershed vary from single-storied, even-aged forests to complex, multi-layered, uneven-aged forests.

Even-aged Forest

Stand replacing disturbances such as clearcut timber harvest and/or windthrow are responsible for most of the even-aged stands within the watershed. These stands are generally classified as young growth. Both the Margaret and Traitors Watersheds were extensively harvested between the 1960's and early 1990's. Margaret Creek VCU has over 5,000 acres of clearcut timber harvest, including nearly half the RMA, and over 30 miles of Forest Service roads. The Traitors Creek VCU has over 4,400 acres of clearcut timber harvest, including roughly a third of the RMA, and over 28 miles of Forest Service roads. Of these harvested stands about 2,063 acres have been pre-commercial thinned or treated in the Margaret Watershed, and 2,514 acres in Traitors Watershed. Most of the thinning activities and treatments were done to benefit timber production; however several large wildlife associated treatments have been implemented within the Margaret Creek watershed.

Uneven-aged Forest

Uneven-aged stands are characterized by a patchy, multi-layer canopy, trees that represent many age classes; larger trees that dominate the overstory; large standing dead trees (snags) or decadent trees; and higher accumulations of large down woody material. These multi-aged stands, which produce at

^[1] Plant association refers to the climax forest plant community type representing the end point of succession.

least 20 cubic feet of wood fiber per acre per year or have greater than 8,000 board feet per acre, are classified as productive old-growth forest.

The remaining forested acres of NFS Lands in the watershed are characterized by non-productive forest. Non-productive forest is associated with muskeg land types including lowlands, fens, riparian areas, broken mountain slopes, plateaus, glacial outwash zones, and other unproductive land types (e.g., steep, narrow canyons associated with areas other than muskegs). Non-productive forest is characterized by very low timber volume, mixed species, and old, defective, and stunted trees.

Harvest History and Regeneration

Approximately 5,000 acres have been harvested within the Margaret VCU, and over 4,400 acres harvested in the Traitors VCU. This represents an estimated 23% and 18% percent respectively of the total VCU areas. Table 12 provides a summary of harvest within the watershed.

Table 12. Acres of Harvest within the VCU

Watershed (VCU)	VCU Area (acres)	Total Harvest (acres)	Total VCU Harvested (percent)
Margaret (7380)	22,333	5,088	23%
Traitors (7390)	25,118	4,455	18%

Source: 2009 Tongass GIS Coverage

Clearcut regeneration harvest method was the primary means of harvesting timber within the area and most harvest occurred between 1964-1993. Table 13 provides harvest summaries by year for the watershed. Figure 21 displays the location of harvest units within the watershed.

Table 13. Harvest History within the Watershed

VCU	1930's	1940's	1950's	1960's	1970's	1980's	1990's	2000's
Margaret (acres)	428	0	342	2475	29	222	1592	0
Traitors (acres)	214	35	18	636	900	1166	1471	15
Percent of Total Harvest	6.73	0.37	3.77	32.60	9.73	14.54	32.10	0.16
Cumulative Total (acres)	642	35	360	3111	929	1388	3063	15
Cumulative Percent	6.73	7.10	10.87	43.47	53.20	67.74	99.84	100

Source: 2009 Tongass GIS Coverage.

Young-growth Management

Young growth treatments in the Margaret Watershed have occurred numerous times since harvest occurred. Numbers of acres treated and specific treatment types are approximate as our records are unrefined. The first stand treatments were from 1983-1987 in about 500 acres, with 12' X 12' spacing. Treatments occurred again in 1990 to 1994 in about 276 acres, 253 acres of 14' X 14' spacing and 23 acres of 24' X 24' spacing. In 2002 about 237 acres were treated which became a study plot for our Tongass Wide Young Growth Study (TWYGS). This treatment involved a combination of thinning and pruning, with about 237 acres thinned at 16'X16' spacing, and about 28 acres pruned. In 2005 another TWYGS module was implemented involving thinning with and without slash treatment for

approximately 30 acres treated at about 23' X 23' spacing. In the same year, 2005, another contract occurred, thinning about 64 acres at 14' X 14' spacing and about 150 acres of 20' X 20' spacing. In 2006 about 654 acres were treated at 14' X 14' spacing, and about 94 acres were treated at a 16' X 16' spacing. The last treatments to occur in Margaret were in 2007 in the Margaret Lake Restoration project. About 45 acres were thinned with gaps, and about 30 acres was alder removal for conifer release.

Future Logging

Since the early 2000's, no timber harvest has occurred within the Margaret or Traitors watershed. The current LUD designations in the watershed still allow for timber harvest within the development LUDs. The Traitors Cove Timber Sale (USDA 2007a) is located in the vicinity of the two VCUs and the sale area is partially inside the VCU boundary, however this sale is currently under litigation.

Riparian Vegetation

Based on the average widths for different channel types, stream riparian areas encompass 844 acres or 9.9 percent of the watershed (Table 14). The distribution of the riparian areas and the harvest within them is shown in Figure 21.

Harvest in Stream Riparian Zones

Of the 2,004 acres of riparian zones in the Margaret VCU, 1,454 acres have been harvested (Table 14), and of the 2,400 acres of riparian zones in the Traitors VCU, 916 acres have been harvested. Total riparian harvest acres in the Margaret VCU equals approximately seven percent of the total stream riparian area in the Margaret VCU, and only 4% in the Traitors VCU (Table 14). The most extensive streamside harvest area and possibly most significant cumulative effects to fish habitat historically within the area occurred along Class I streams in the main stem of Margaret Creek above Margaret lake. Overstory vegetation in this area has largely recovered in the 55 years since harvest, however as mentioned above, the size and distribution of species has greatly changed.

In addition, there has been some harvest along the banks of Class III and Class IV streams (not mapped) that directly influence downstream Class I and II channels.

Table 14. Riparian Harvest within the Watershed

VCU	VCU Area (acres)	Total Harvest (acres)	Total RMA in VCU (acres)	Total RMA in VCU (percent)	RMA Harvested (acres)	Total Riparian Area Harvested (percent)
Margaret	22,333	5,088	2,004	9%	1,454	7%
Traitors	25,118	4,455	2,400	10%	916	4%

Source: 2009 Tongass GIS Coverage.

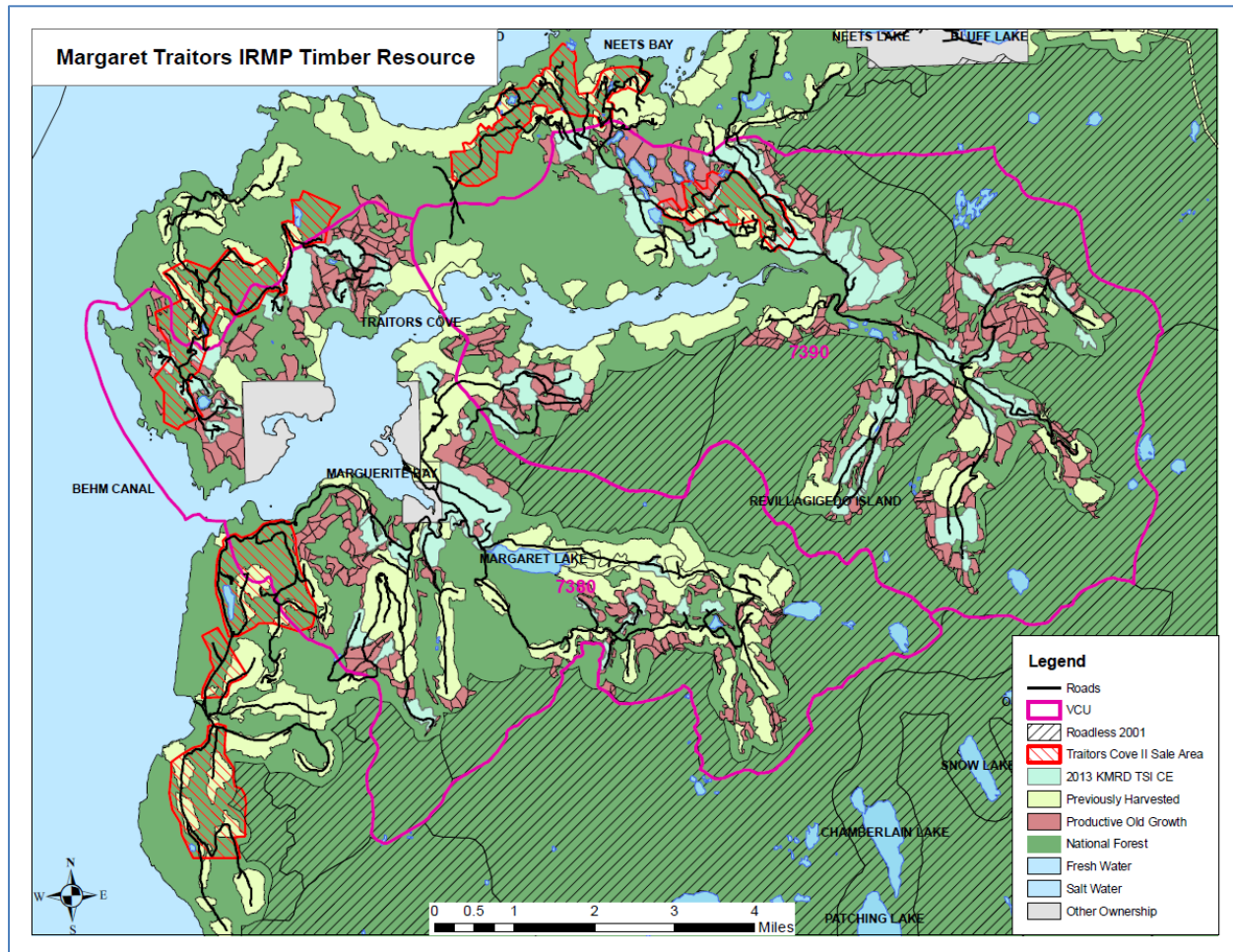


Figure 21. Existing vegetation management within the Margaret-Traitors VCUs.

Source: 2009 Tongass GIS Coverage.

Need for Change

Provide for the continuation of timber uses and resources by managing the timber resource for production of saw timber and other wood products from suitable forest lands on an even-flow, long-term sustained yield basis and in an economically efficient manner.

Possible Activities

- The mechanisms that are available to provide the desired future conditions are large sales, small sales, micro sales, stewardship contracts and administrative use permits. Since these areas have been previously managed the majority of the future projects would be pre-commercial and commercial thinning. The 2013 KMRD Timber Stand Improvement Categorical Exclusion has the majority of the previously harvested stands slated for thinning.
- Selectively thin and girdle trees within the RMA to increase conifer spacing and remove dominant red alder species to promote conifer growth, encourage understory development and old growth characteristics.

Wildlife

Existing Condition

Both the Margaret and Traitors Watersheds were extensively harvested between the 1960's and early 1990's. Margaret Creek watershed has over 3,000 acres (VCU 5,140 acres) of clearcut timber harvest, including nearly half the RMA, and over 30 miles of Forest Service roads. The Traitors Creek watershed has over 2700 acres (VCU 4,459 acres) of clearcut timber harvest, including roughly a third of the RMA, and over 28 miles of Forest Service roads. Of these harvested stands about 2,063 acres have been pre-commercial thinned or treated in the Margaret Watershed, and 2,514 acres in Traitors Watershed. Most of the thinning activities and treatments were done to benefit timber production; however several large wildlife associated treatments have been implemented with the Margaret Creek watershed. See the paragraph above labeled Young Growth within the Vegetation section for more details on specific treatments within the young growth stands. Prior to harvest, the stands were productive old growth habitat that served as valuable winter deer habitat.

Most of the managed stands currently lack large enough trees and canopy cover to provide snow interception and thermal cover to deer, as well as adequate browse needed for winter survival. Heavy slash in some of the more recently treated young growth stands poses a problem for deer migration and understory development.

Need for Change

Harvest activities and stand conversion have reduced wildlife habitat quantity, quality and connectivity of productive old growth in the watershed for Management Indicator Species (MIS) such as Sitka black-tailed deer, marten and goshawk (species identified in the Tongass Forest Plan (USDA Forest Service 2008) as dependent on old growth habitat). More specifically:

- VCU 7380, Margaret, has had 23% of the total VCU area harvested.
- VCU 7390, Traitors, has had 18% of the total VCU area harvested.
- The vast majority of deer winter refugia (south facing, low elevation old growth) have been harvested.
- Many of the wildlife treated stands are maintaining browse species, but have little to no snow interception capabilities.
- Untreated stands are losing browse species as the canopy closes.

Possible Activities

- Implement slash treatments (removal, brushing, pile, scatter, burn) through areas of heavy slash to facilitate wildlife movement.
- Implement vegetation treatments - a combination of girdling, pruning, thinning, and gap treatments of $\frac{1}{4}$ to $\frac{1}{2}$ acre - to increase tree spacing and encourage understory development and old growth characteristics.
- Create thickets or no-cut areas to allow for snow interception.
- Treat previously harvested stands to reduce conifer tree density and improve understory development and deer winter range habitat.
- Develop and/or enhance existing interpretation and education signs at Marine Access Facility (MAF) & bear viewing site.
- Enhance bear viewing area to minimize bear/human interactions.

Project Integration

After the IRMP Assessment Team reviewed the existing condition, need for change, and possible activities for all resources, a list integrated project ideas (below) was compiled by the group and then prioritized by the District Ranger. Projects were integrated by project type and the resources involved (Figures 22-26). For example Fisheries have identified a need for inserting large wood into Margaret Creek and Engineering has identified road maintenance activities. Pairing the Fisheries large wood project with Engineering's road maintenance projects can utilize the same contractor thereby reducing overall costs associated with the work such as equipment mobilization fees. By coordinating projects, costs associated with travel may also be reduced, work effort may, on occasion, be shared by groups working together in the same area, and project benefits to multiple groups are recognized.

Integrated Projects

1. Vegetation Management (*coordinates and benefits timber/silviculture, fisheries and wildlife resources*)
 - a. Selectively thin and girdle trees within the RMA to increase conifer spacing and remove dominant red alder species to promote conifer growth, encourage understory development and old growth characteristics.
 - b. Treat young-growth stands to promote stand development through pre-commercial and commercial thinning.
 - c. Improve wildlife habitat in young growth stands by creating gaps, (e.g. girdling and pruning) and no-cut areas.
 - d. Improve wildlife access to young-growth stands by implementing slash treatment in stands with heavy slash loads.
 - e. Utilize large wood from timber sale or blowdown to enhance streams.
 - f. Provide large sales, small sales, micro sales, stewardship contracts and administrative use permits for pre-commercial and commercial thinning. The 2013 KRMD TSI CE has the majority of the previously harvested stands slated for thinning.

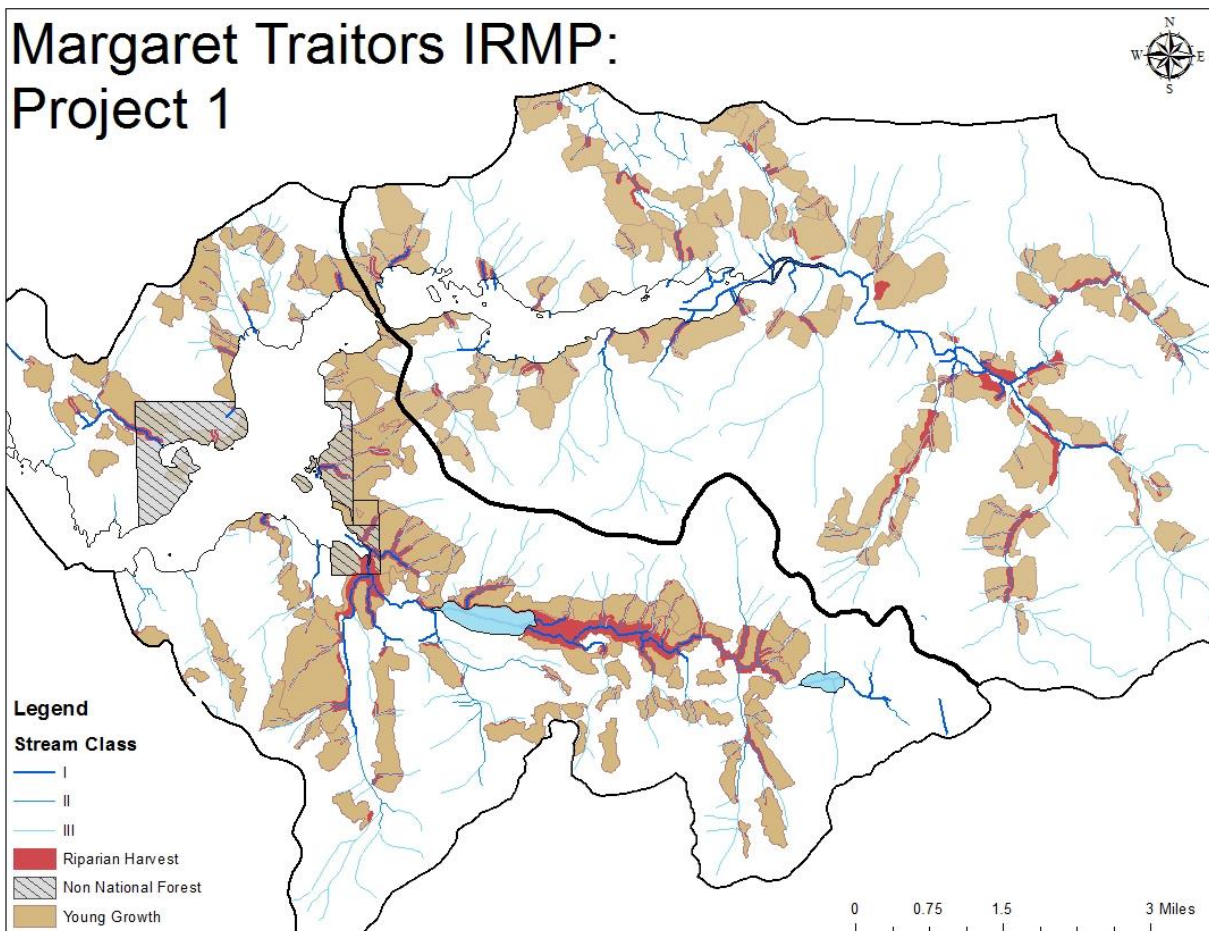


Figure 22. Margaret- Traitors Creek Watersheds: Project Components for Integrated Project 1.

2. Signs, Kiosks and Cooking Platform (*coordinates and benefits recreation, fisheries, wildlife, archeology, botany, and timber resources*)
 - a. Rebuild kiosks at boat dock and bear viewing site to better display information to the public about: recreation, fisheries, wildlife, botany, cultural, and timber resources.
 - b. Create, install, and/or replace information signs at the bear viewing site & associated trail and along the road system to tell our story to visitors.
 - c. Install a cooking platform at the boat dock to prevent visitors from burning the dock when using propane stove.

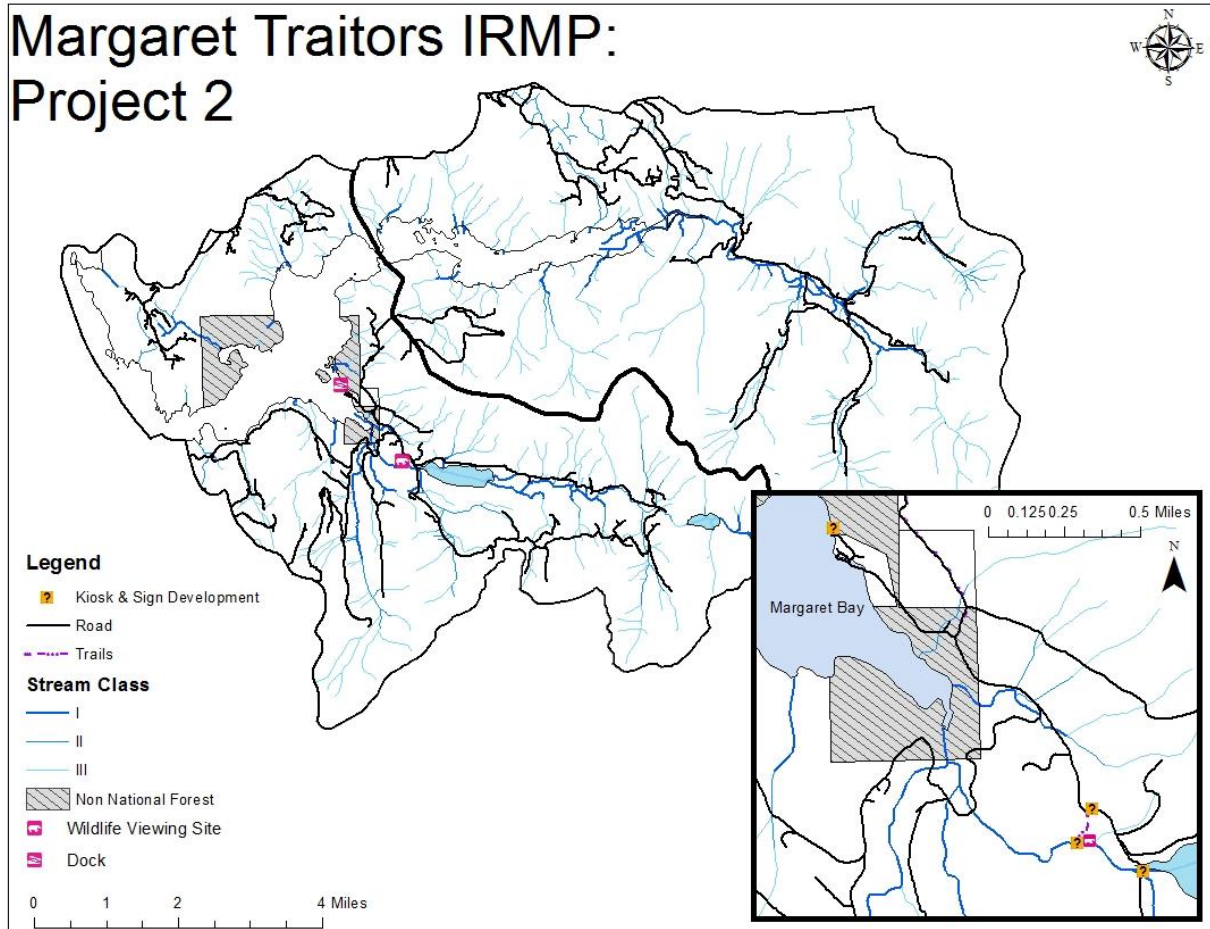


Figure 23. Margaret- Traitors Creek Watersheds: Project Components for Integrated Project 2.

3. Road Maintenance, Stream Restoration, Invasive plant treatment (*coordinates and benefits engineering, fisheries, and botany resources*)
 - a. Road maintenance
 - i. Continue roadside brushing at three to four year intervals, to keep the roads open and provide adequate sight distance.
 - ii. Continue to monitor and repair/remove landslides along the road system as priorities allow.
 - iii. Remove, replace, and/or repair culverts and bridges.
 - iv. Recondition roadway, shoulders, and ditches, clean out culvert inlets, and place rock lifts in areas that are identified.
 - v. Continue grading roads as needed to reduce potholes.
 - b. Stream Restoration
 - i. Remove and replace the sixteen red pipes in the Margaret and Traitors watersheds to restore fish passage.
 - ii. Restore channel processes within Margaret and Traitors Creeks by placing large wood, road obliteration, and riparian vegetation treatment.
 - c. Treat invasive plants along the Margaret Traitors road systems.
 - i. Use herbicide and/or mechanical means to reduce or eradicate invasive plants along roads system.

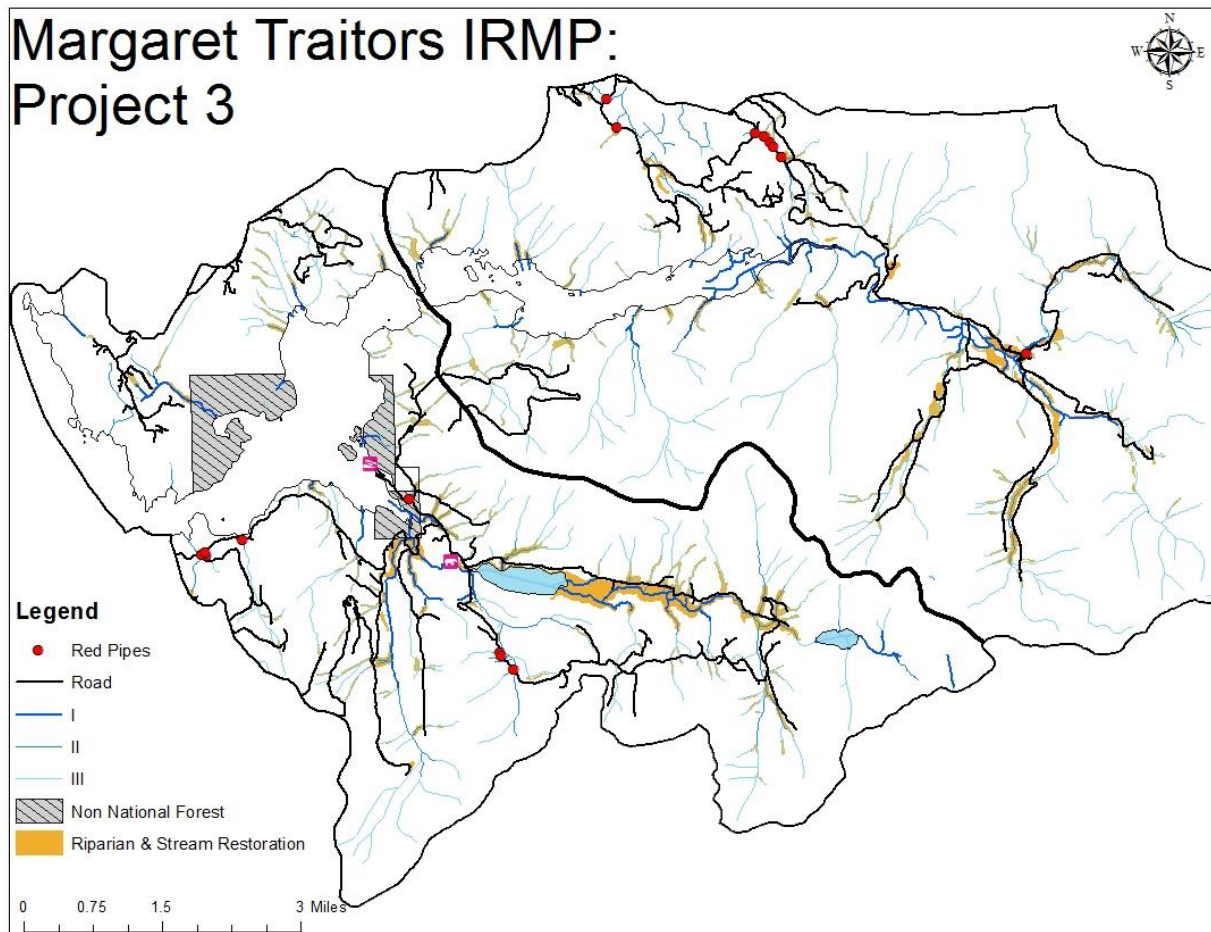


Figure 24. Margaret - Traitors Creek Watersheds: Project components for Integrated Project 3

4. Convert Margaret Cabin to Public Use and rebuild fishpass staircase (*coordinates and benefits recreation and fisheries resources*)
 - a. Convert the Margaret Bay administrative camp to a public recreation rental cabin. Cabin could still be reserved for administrative use when needed.
 - b. Rebuild staircase from Margaret fishpass to Margaret Wildlife Observation Site

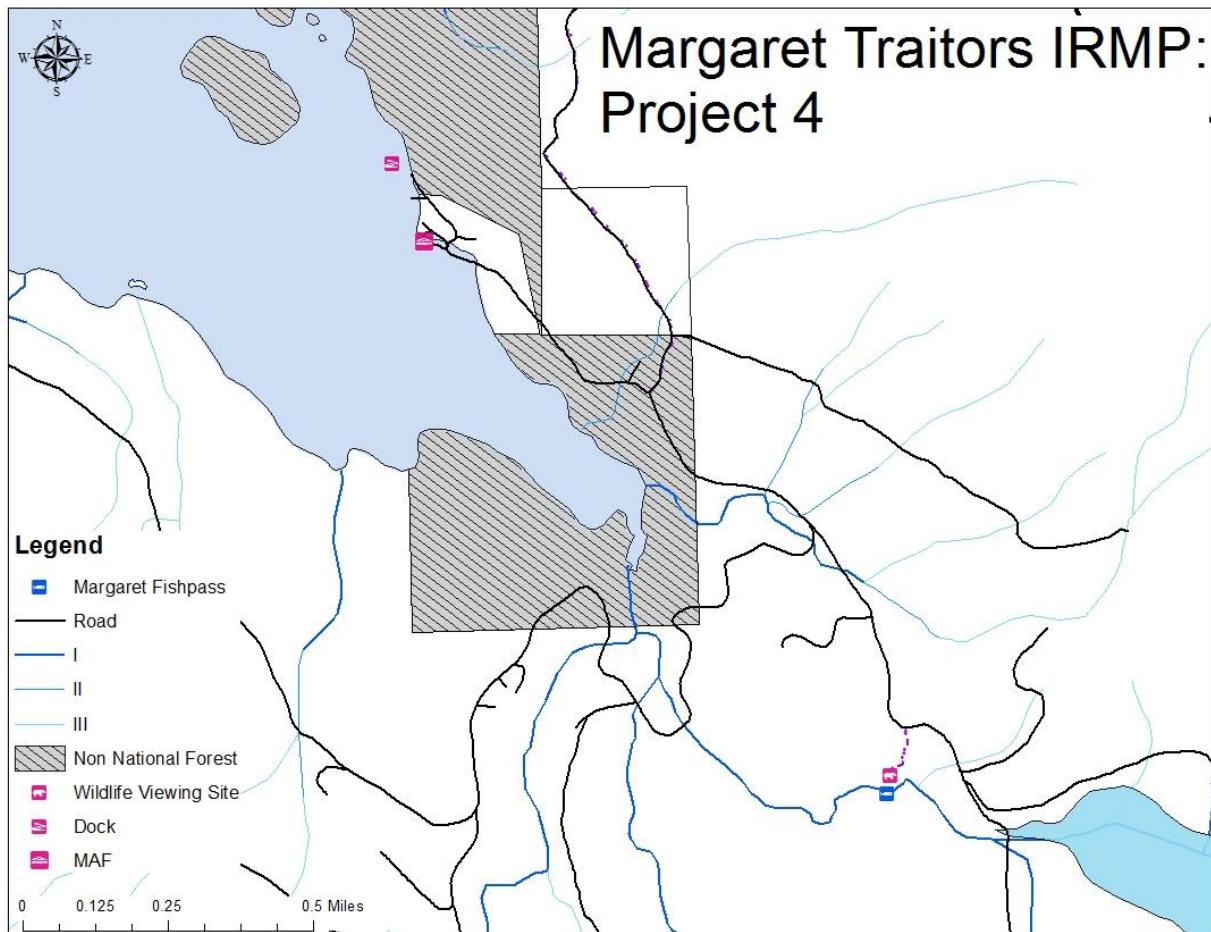


Figure 25. Margaret- Traitors Creek Watersheds: Project Components for Integrated Project 4.

5. Rebuild Wildlife Observation Site (*coordinates and benefits recreation, fisheries, and wildlife resources*)
 - a. rebuild platform, install blinds, elevate trail/boardwalk

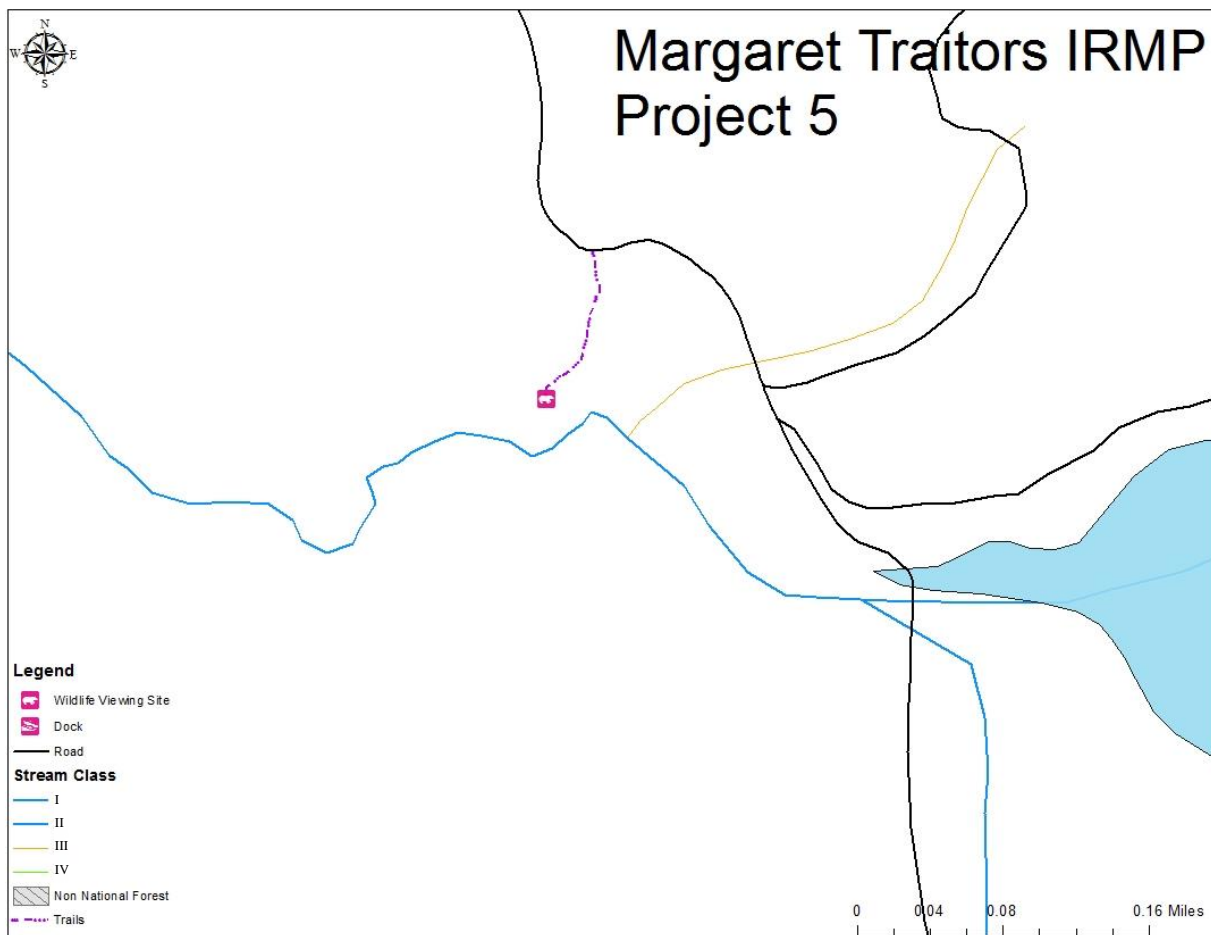


Figure 26. Margaret- Traitors Creek Watersheds: Project Components for Integrated Project 5.

Additional Needs

Aquatics

Margaret Creek Watershed

- Perform Tier III surveys to determine the need for restoring the natural erosion and sediment transport regimes in the RMAs that have been harvested as well as stream reaches lacking in large woody debris starting at the headwaters, specifically above Margaret Lake.
 - Locate specific sites and determine number of pieces of large wood to add to the channel and placement type (i.e. channel spanning, along point bar, partially within channel, etc.).
- Perform AOP surveys on all fish crossings on the Margaret & Traitors Road systems & address the current 16 total Red pipes in the Margaret & Traitors Watersheds by resurveying and determining the need for replacement.
- Resurvey 11 historical cross sections on Margaret Creek to determine need for other restoration opportunities.
- Look for opportunities in the RMA to promote and shorten the recruitment wait time of large woody debris in stream channel.
- Monitor Fishpass at Margaret for annual maintenance. Replace missing baffles and repair trail down to ladder.
- Visit Barrier 2.3km upstream from salt water on Traitors creek for barrier enhancement opportunities.

Botany and Invasive Plants

Survey the extent and spread of invasive plants along the Margaret and Traitors road system.

Soils

Need an in-depth landslide inventory for the Margaret - Traitors Creek Watersheds.

Vegetation

Collect additional riparian vegetation survey information to determine thinning prescriptions that would most enhance riparian function.

Conduct upland vegetation surveys to determine if thinning activities would accelerate development of old-growth habitat characteristics that benefit dependent mammalian and avian species.

Wildlife

Survey young growth stands with a silviculturist to determine site specific treatments that will benefit wildlife in both the short and long term.

References

- Gier, J. 2000. Mechanics driving landslide occurrence in the Margaret Lake Basin (1995-1999). Tongass National Forest Ketchikan-Misty Fiords Ranger District. 35 p.
- Goldschmidt, Walter R. and Theodore H. Haas. 1998. Haa Aani', Our Land: Tlingit and Haida Land Rights and Use. Edited with an Introduction by Thomas F. Thornton. University of Washington Press, Seattle.
- Olson, Ronald L. 1967. Social Structure and Social Life of the Tlingit in Alaska. Anthropological Records Volume 26. University of California Press (Berkeley and Los Angeles) and Cambridge University Press (London).
- Roppel, Patricia. 1998. Land of Mists Revillagigedo & Gravina Islands Misty Fiords National Monument Alaska. Farwest Research. P.O. Box 1998, Wrangell, Alaska. 99929.
- Orth, Donald J. 1971. Dictionary of Alaska Place Names. Geological Survey Professional Paper 567. Government Printing Office, Washington, D.C.
- USDA Forest Service. 2001a. Aquatic Habitat Management Handbook. FSH 2090.21, Forest Service Handbook. Alaska Region, Juneau, Alaska, 182 pp. http://www.fs.fed.us/cgi-bin/Directives/get_dirs/fsh?2090.21!r10_ALL
- USDA Forest Service. 2006a. Soil and Water Conservation Handbook. FSH 2509.22. Forest Service Handbook, Juneau, Alaska. Available online at: http://www.fs.usda.gov/detail/r10/landmanagement/?cid=fsbdev2_038796
- USDA Forest Service. 2007a. Traitors Cove Timber Sale, Final Environmental Impact Statement. Filed at Ketchikan-Misty Fiords Ranger District, Tongass National Forest, Alaska Region.
- USDA Forest Service. 2007b. The Traitors Creek Watershed Restoration Plan. Filed at Ketchikan-Misty Fiords Ranger District, Tongass National Forest, Alaska Region.
- USDA Forest Service. 2007c. The Margaret Creek Watershed Restoration Plan. Filed at Ketchikan-Misty Fiords Ranger District, Tongass National Forest, Alaska Region.
- USDA Forest Service. 2008. Tongass National Forest Land and Resource Management Plan (R10-MB-603b, 2008), United States, Forest Service.
- USDA Forest Service. 2008g. Access and Travel Management Plan Environmental Assessment and Decision Notice. Ketchikan-Misty Fiords Ranger District, Tongass National Forest, Ketchikan, Alaska. Available online at: http://www.fs.usda.gov/wps/portal/fsinternet!/ut/p/c5/04_SB8K8xLLM9MSSzPy8xBz9CP0os3gDfxMDT8MwRydLA1cj72BTUwMTAwgAykeaxRtBeY4WBv4eHmF-YT4GMHkidBvgAl6EdleDXlvfdrAJuM3388jPTdUvyA2NMMgyUQQAyrgQmg!!/dl3/d3/L2dJQSEvUUt3QS9ZQnZ3LzZfS000MjZOMDcxT1RVODBJN0o2MTJQRDMwODQ!/?project=30807
- USDA Forest Service. 2010. USDA Forest Service Alaska Region: Channel Type User Guide Revision 2010.
- USDA Forest Service. 2013. 2013 Ketchikan-Misty Fiords Ranger District Timber Stand Improvement CE. Filed at the Ketchikan-Misty Fiords Ranger District, Tongass National Forest, Alaska Region.
- Vancouver, George. 1798(1984) A Voyage of Discovery to the North Pacific Ocean and Round the World, 1791-1795. Vol. III, edited by K. Lamb. Hakluyt Society, London.
- Waterman, Thomas Talbot. 1922. Tlingit Geographical Names of Extreme Southeast Alaska with Historical and Other Notes. Unpublished Manuscript, Bureau of American Ethnology Manuscript Vault, MS No. 1863, 2915, 2916, and 2938. Archives of the Bureau of American Ethnology, Smithsonian Institution, Washington, D.C.